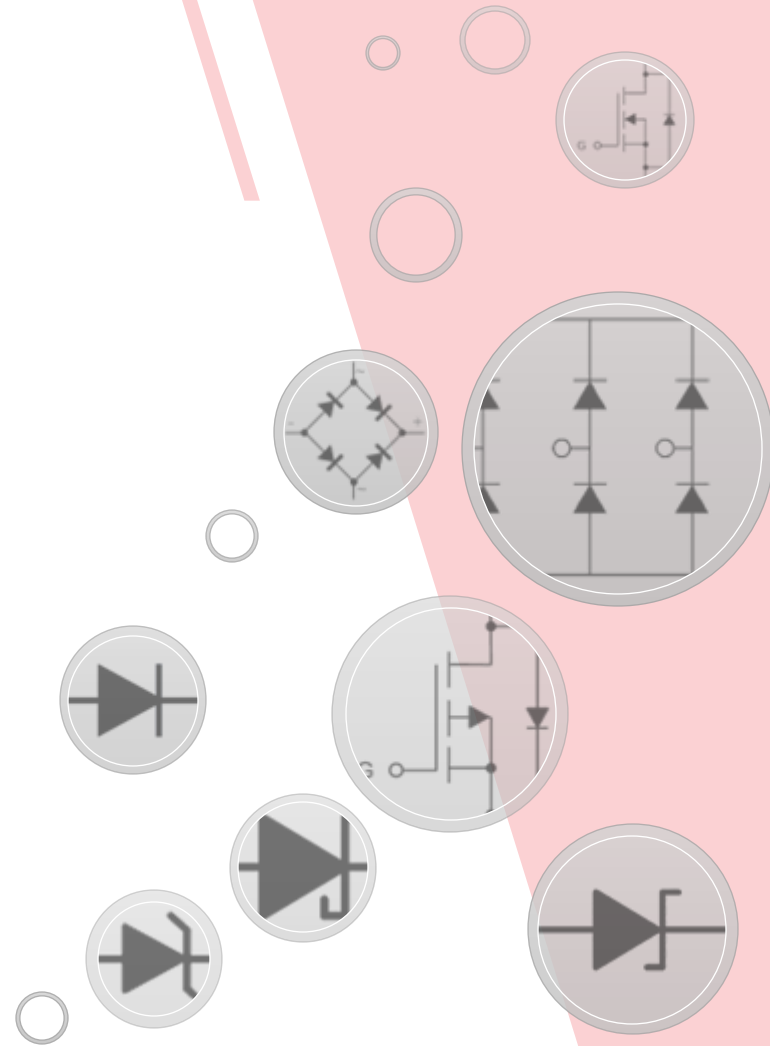
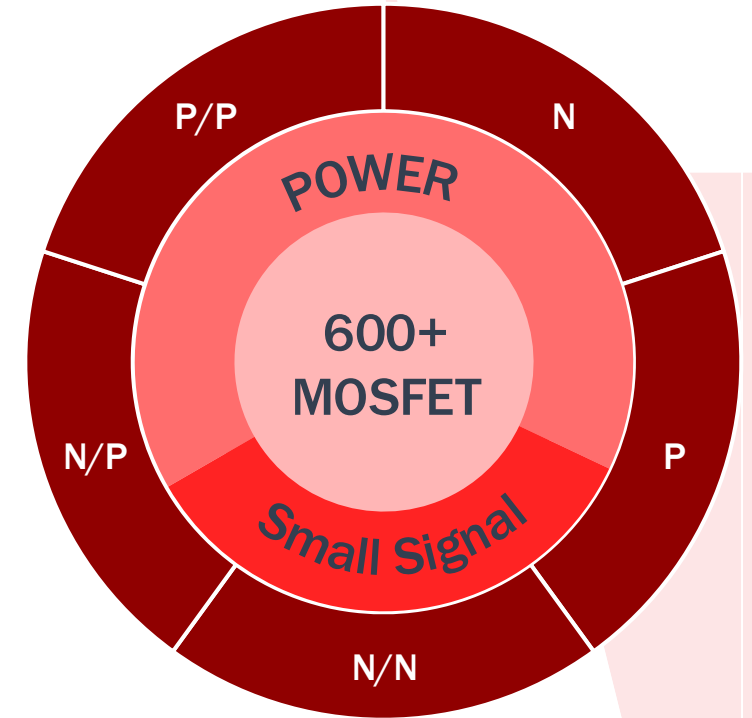
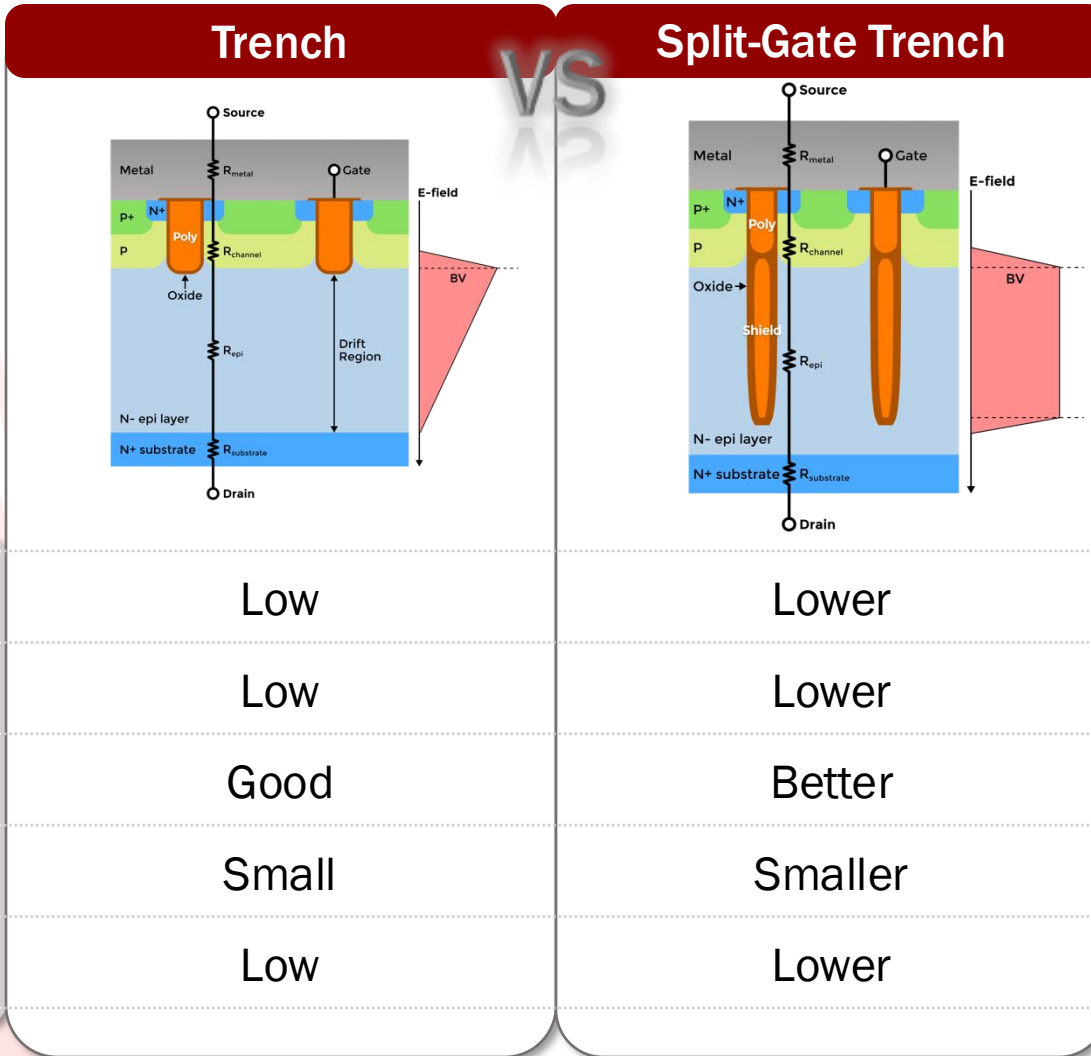


MCC 40V MOSFET

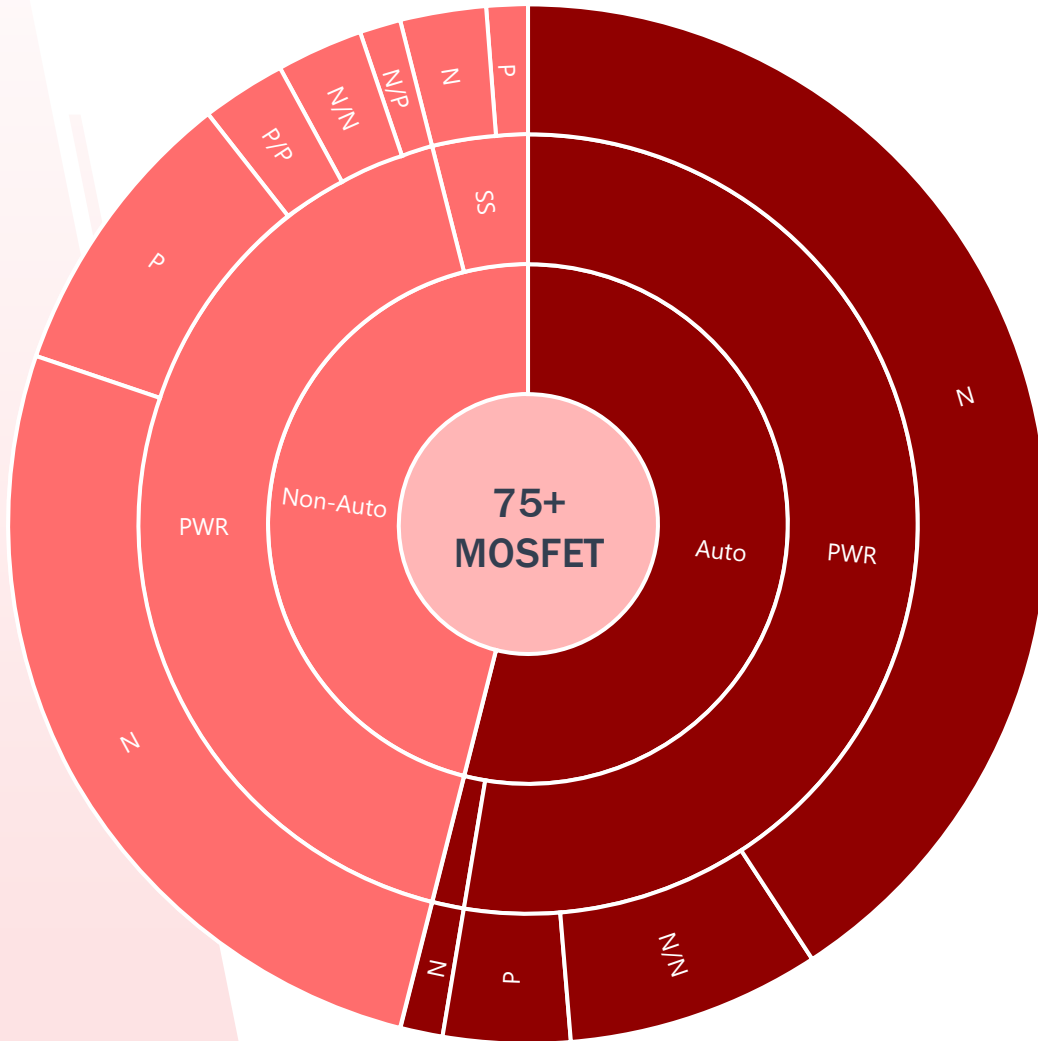


MCC MOSFET Technologies & Products



Classification	Voltage	Technologies
LV Low voltage	12V ~ 30V	Trench
MV Medium voltage	40V ~ 200V	Trench, SGT
HV High voltage	> 400V	Super Junction

40V MOSFET Portfolio Overview

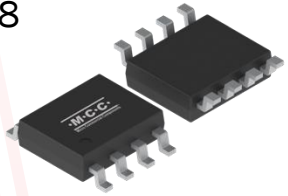


Category	Automotive		Non-Automotive	
Family	Small Signal	Power	Small Signal	Power
Channel	N	N P N/N	N P	N P N/N N/P P/P
Packages	SOT-23	DFN3333 DFN3333-8(SWF) PDFN3333 DFN5060 DFN5060-C DFN5060-DSC PDFN5060-8D TOLL-8L DPAK D2-PAK TO-263-7	DFN5060-6LE SOT-23	DFN3333 DFN3333-D DFN5060 DFN5060-C TOLL-8L SOP-8 DPAK D2-PAK TO-263-7
Part count	1	40	3	32

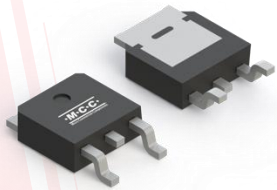
40V MOSFET Packages

Leaded

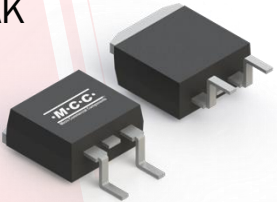
SOP-8



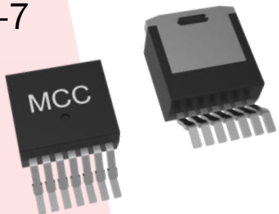
DPAK



D2-PAK

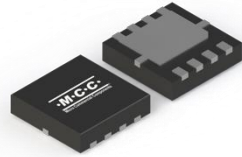


TO-263-7

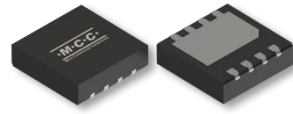


Leadless

DFN3333



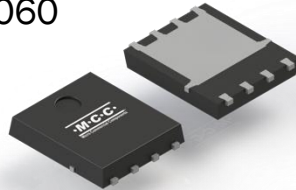
DFN3333-8(SWF)



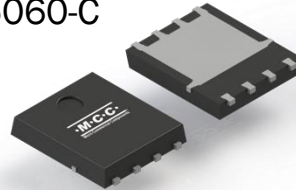
PDFN3333



DFN5060



DFN5060-C



DFN5060-DSC



TOLL-8L



DFN3333-D

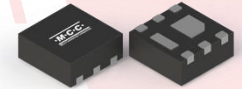


PDFN5060-8D

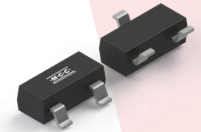


Small Signal

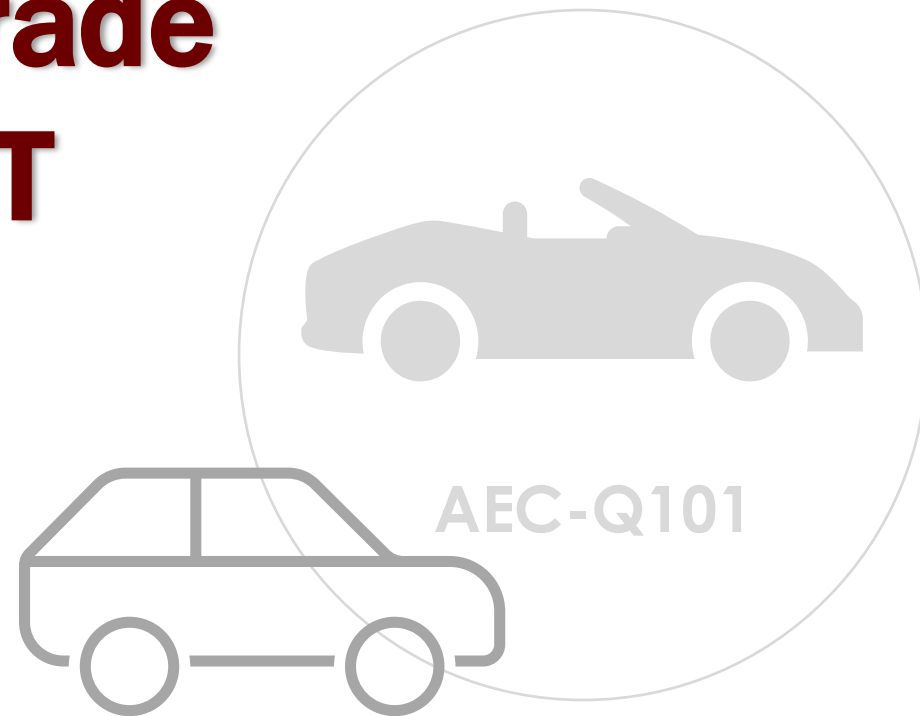
DFN2020-6LE



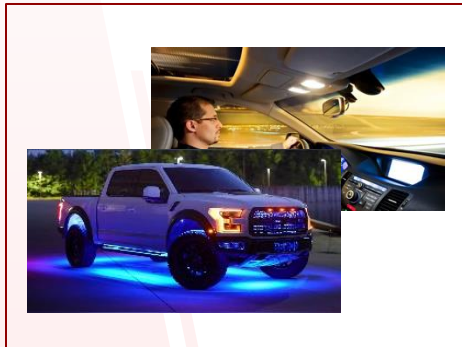
SOT-23



Automotive Grade Power MOSFET



Automotive Segment Application Examples



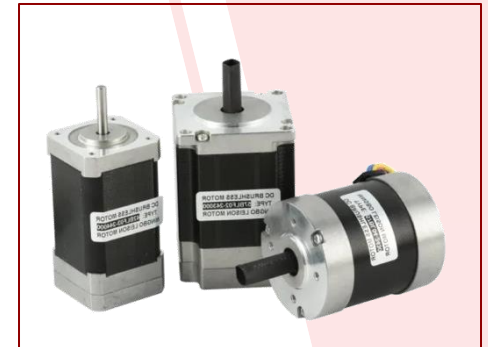
LED Lighting



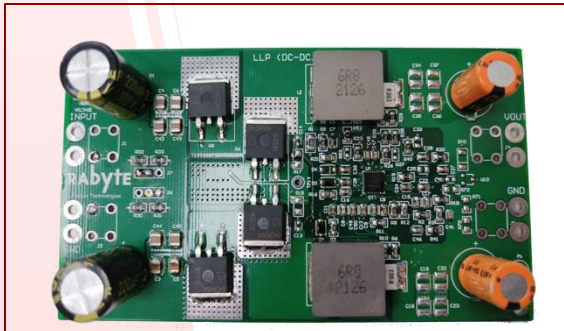
Battery Management System



Oil Pump



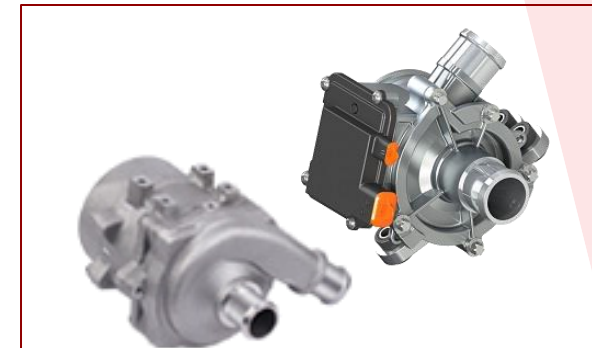
Motor Drives



DC-DC Converter



Electric Power Steering



Water Pump

Automotive Grade 40V Power MOSFET Portfolio



Automotive Grade			
Channel	RDSon max (mΩ) @VGS=10V	Packages	
		Leaded	Leadless
N	0.8 ~ 16	D2-PAK, DPAK, TO-263-7	DFN3333, DFN3333-8(SWF), PDFN3333, DFN5060, DFN5060-C, DFN5060-DSC, TOLL-8L
P	13 ~ 15	DPAK	DFN3333-8(SWF), DFN5060
N/N	5 ~ 15		PDFN5060-8D

40V N-Ch Power MOSFET

DFN5060



Part Number	MCACL 280N04YHE3	MCAC 180N04YHE3	MCAC 120N04YHE3	MCAC 95N04YHE3	MCAC 88N04YHE3	MCACD 60N04YHE3
Configuration	N	N	N	N	N	N+N
R _{DS(ON)} (mΩ) (Typ.) (Max.)	0.6 0.8	1.50 2.00	2.40 3.10	2.40 3.20	3.50 4.50	4.20 5.50
V _{GS(th)} (V) (min. - max.) (typ.)	2.0 - 4.0 2.8	2.0 - 4.0 3.1	2.0 - 4.0 3.1	2.0 - 4.0 2.8	2.0 - 4.0 2.8	2.0 - 4.0 3.1
I _D (A) @25°C	280	180	120	95	88	60
Q _g (nC) typ.	79	56	38	27.7	15.6	15.6
T _j (°C)	-55 to +175	-55 to +175	-55 to +175	-55 to +175	-55 to +175	-55 to +175

40V N-Ch Power MOSFET

DFN5060



Part Number	MCACL 320N04YQ	MCACL 330N04YHE3	MCACL 220N04YHE3	MCAC 130N04YHE3	MCAC 125N04YHE3	MCAC 85N04YHE3	MCAC 75N04YHE3	MCACD 55N04YHE3
Configuration	N	N	N	N	N	N	N	N+N
R _{DS(ON)} (mΩ) (Typ.) (Max.)	0.85 1.10	0.80 1.00	0.95 1.30	1.50 1.75	2.00 2.60	4.30 6.00	5.20 6.80	6.50 8.50
V _{GS(th)} (V) (min. - max.) (typ.)	2.0 - 3.0 2.5	2.0 - 4.0 2.8	1.0 - 2.5 1.7	1.2 - 2.5 1.7	2.0 - 4.0 3.0	2.0 - 4.0 3.0	2.0 - 4.0 3.0	2.0 - 4.0 3.0
I _D (A) @25°C	320	330	220	130	125	85	75	55
Q _g (nC) typ.	88	133	131	129	42	19	13	13
T _j (°C)	-55 to +175	-55 to +175	-55 to +175	-55 to +175	-55 to +175	-55 to +175	-55 to +175	-55 to +175

40V Power MOSFET

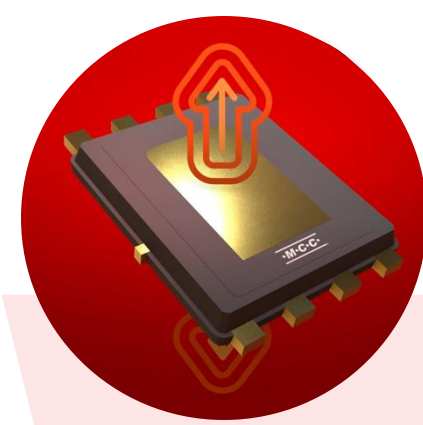
DFN3333(SWF) & TOLL



DFN3333 Side-Wettable Flank		
Part Number	MCGWF 45P04HE3	MCGWF 60N04YHE3
Configuration	P	N
V _{DS} (V)	40	40
R _{DS(ON)} (mΩ) (Typ.) (Max.)	10 13	3.00 3.90
V _{GS(th)} (V) (min. – max.) (typ.)	1.0 – 3.0 1.6	2.0 – 4.0 3.0
I _D (A) @25°C	45	60
Q _g (nC) typ.	73.4	38
T _J (°C)	-55 to +150	-55 to +175

TOLL-8L		
Part Number	MCTL 320N04YQ	MCTL 270N04YHE3
Configuration	N	N
V _{DS} (V)	40	40
R _{DS(ON)} (mΩ) (Typ.) (Max.)	0.80 1.10	1.00 1.30
V _{GS(th)} (V) (min. – max.) (typ.)	2.0 – 3.0 2.5	2.0 – 4.0 3.0
I _D (A) @25°C	320	270
Q _g (nC) typ.	88	135.6
T _J (°C)	-55 to +175	-55 to +175

Automotive Grade DFN5060 Dual-Side Cooling MOSFET



Features & Benefits

- AEC-Q101 Qualified
- SGT Technology
- Low $R_{DS(on)}$
- N-Ch MOSFET
- Dual-side cooling

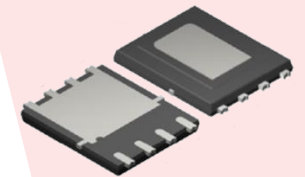
Applications

- BMS
- Motor Drives
- DC-DC converters



Specifications

		MCACLS290N04YHE3	MCACLS330N04YHE3
V_{DS}		40V	40V
$R_{DS(on)}$ @ $V_{GS}=10V$	typ.	0.85m Ω	0.83m Ω
	max.	1.10m Ω	1.10m Ω
Q_g	typ.	79nC	115.9nC
V_{GS}		$\pm 20V$	$\pm 20V$
$V_{GS(th)}$	min.	2.0V	2.0V
	typ.	2.8V	2.6V
	max.	4.0V	4.0V
I_D	@ $T_C=25^\circ C$	290A	330A
	@ $T_C=100^\circ C$	205A	233A
T_J		-55 $^\circ C$ to +175 $^\circ C$	-55 $^\circ C$ to +175 $^\circ C$
Package		DFN5060-DSC	DFN5060-DSC
Dimension	max.	5.30 x 6.70 x 0.76mm	5.30 x 6.70 x 0.76mm

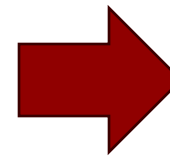


DFN5060 vs DFN5060 DSC Test Result

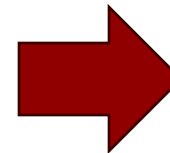


- Test Condition:
 - Current: 15A
 - Ambient Temperature: 20.5°C
 - Period: 3 hours

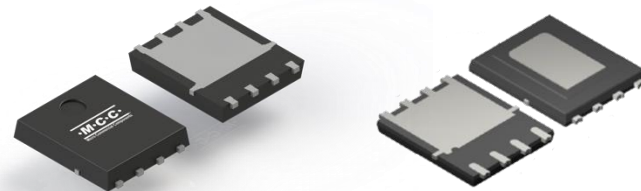
Parameter	Unit	MCACL330N04Y	MCACLS330N04YAHE3
VF	V	0.511	0.542
Tj	°C	165.1	143.9
Pd	W	7.665	8.13
Max Temp @ Heatsink topside	°C	107.7	111.7
Rthj-a	°C/W	18.9	15.2
Rthj-heatsink	°C/W	7.5	4.0



- Rise of temperature is lower
- Better thermal margin for higher current capability



- Higher power dissipation resulted in higher heatsink temperature.
- Junction-to-heatsink thermal resistance is lower



Non-Automotive Grade Power MOSFET



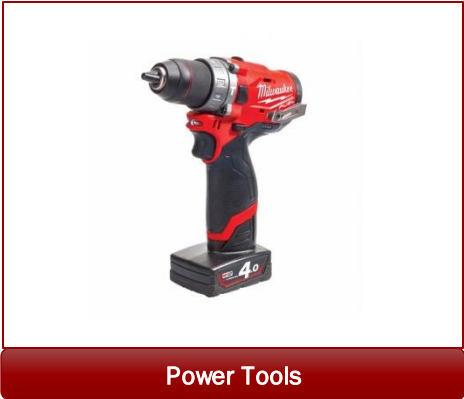
Industrial & Consumer Segment Application Examples



DC Fan



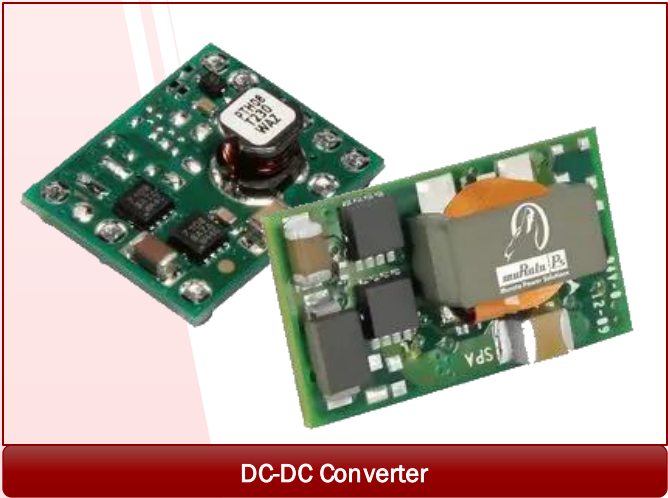
Battery Management System



Power Tools



Motor Drives



DC-DC Converter



Home Alarm System



Home Appliances

Non-Automotive Grade 40V Power MOSFET Portfolio



Non-Automotive Grade			
Channel	RDson max (mΩ)	Packages	
	@VGS=10V	Leaded	Leadless
N	0.85 ~ 15	D2-PAK, TO-263-7, DPAK, SOP-8	DFN3333, DFN5060, DFN5060-C, TOLL-8L
P	10 ~ 21	DPAK, SOP-8	DFN3333
N/N	18 ~ 32	SOP-8	DFN3333-D
N/P	32/33	SOP-8	
P/P	23 ~ 50	SOP-8	

Non-Automotive Grade 40V Power MOSFET



Part Number	MCU 45P04B	MCB 220N04Y	MCBS 220N04Y	MCG 50N04	MCACL 330N04Y	MCTL 270N04Y
Configuration	P	N	N	N	N	N
$R_{DS(ON)}$ (m Ω) (Typ.) (Max.)	11 14	1.20 1.50	0.85 1.10	3.3 4.0	0.65 0.85	1.00 1.30
$V_{GS(th)}$ (V) (min. – max.) (typ.)	-1.0 – -2.3 -1.5	2.0 – 4.0 3.1	2.5 – 4.5 3.1	1.0 – 2.5 1.5	2.0 – 4.0 3.2	2.0 – 4.0 3.0
I_D (A) @25°C	-45	220	220	50	330	270
Q_g (nC) typ.	58	136	132	102	133	15.6
T_j (°C)	-55 to +175	-55 to +175	-55 to +175	-55 to +150	-55 to +175	-55 to +175
Package	DPAK	D2-PAK	T0-263-7	DFN3333	DFN5060-C	TOLL-8L

Explore the additional 40V MOSFET resources below, or contact us at [MCCsemi.com](https://www.mccsemi.com)

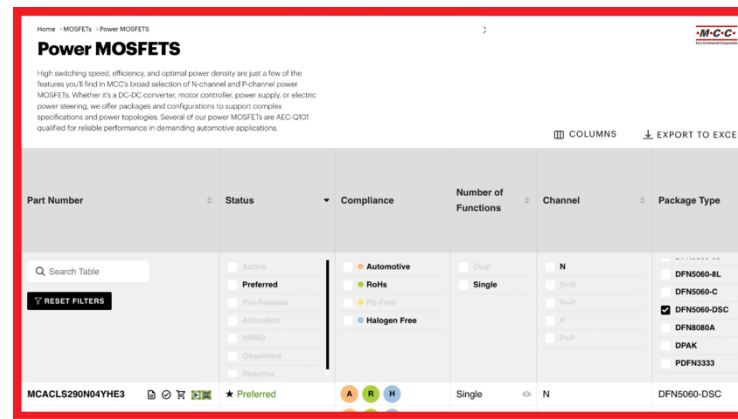


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Micro Commercial Components

On-Demand Educational Webinar
40V MOSFET

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Power MOSFETS

High switching speed, efficiency, and optimal power density are just a few of the features you'll find in MCC's broad selection of N-channel and P-channel power MOSFETs. Whether it's a DC-DC converter, motor controller, power supply, or electric power steering, we offer packages and configurations to support complex specifications and power topologies. Several of our power MOSFETs are AEC-Q101 qualified for reliable performance in demanding automotive applications.

COLUMNS EXPORT TO EXCEL

Part Number	Status	Compliance	Number of Functions	Channel	Package Type
MCACL5290N04YHE3	Active	Automotive	Single	N	DFN5060-BL
	Preferred	RoHS			DFN5060-C
	Pre-release	Halogen Free			DFN5060-DSC
	Obsolete				DFN8080A
	Discontinued				DPAK
	Reactive				PDFN3333

MCAACL5290N04YHE3 Preferred Single N DFN5060-DSC

[Online Power MOSFET Catalog](#)



MCCsemi
Micro Commercial Components

Functions & Features

The Essential Guide to 40V MOSFET

Oxide

Source

Drain

Gate

[40V MOSFET Guide](#)