Description

This 30V 56A, N-Channel MOSFET in a PDFN5*6 Plastic Package.

Applications

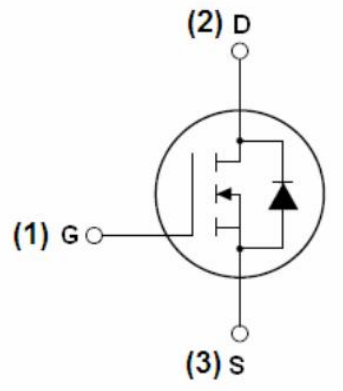
- Battery Management
- High Frequency Point-of-Load Synchronous Buck Conventer for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

Features

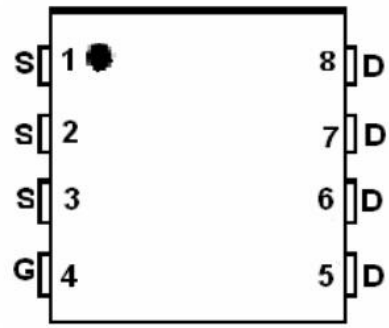
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance
- Halogen-free Product

V_{DSS}	$R_{DS(on)}$ Typ	I_D
30V	2.9mΩ	56A

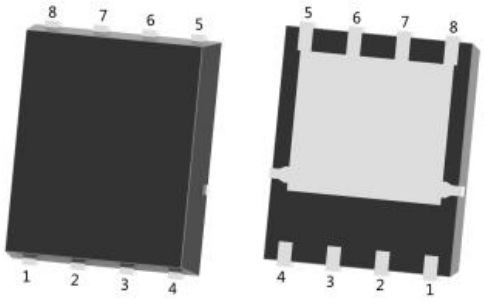
Equivalent Circuit & Pinning



Schematic diagram



Pin assignment



PDFN5X6-8L

Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	30	V
Continuous Drain Current		I_D	56	A
Pulsed Drain Current		I_{DM}	168	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		$P_D(T_c=25℃)$	33	W
Avalanche energy(L=0.5mH)		E_{AS}	72	mJ
Avalanche Current(L=0.5mH)		I_{AS}	36	A
Junction and Storage Temperature Range		T_j, T_{stg}	-55 to 150	℃
Maximum Junction-to-Ambient	t ≤ 10s	$R_{\theta JA}$	30	℃/ W
	Steady-State		54	
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	3.8	

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250uA, V_{GS}=0V	30	31		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1.0	uA
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}= ±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.8	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		2.9	3.1	mΩ
		V_{GS}=4.5V, I_D=10A		4.1	4.8	
Diode Forward Voltage	V_{SD}	I_S=1A, V_{GS}=0V		0.68	1	V
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1.0MHz		3030		pF
Output Capacitance	C_{oss}			355		
Reverse Transfer Capacitance	C_{rss}			260		
Gate resistance	R_g	V_{GS}=0V V_{DS}=0V f=1MHz		3		Ω
Total Gate Charge	$Q_{g(10V)}$	V_{GS}=10V, V_{DS}=15V, I_D=20A		63		nC
Total Gate Charge	$Q_{g(4.5V)}$			29		
Gate Source Charge	Q_{gs}			9.0		
Gate Drain Charge	Q_{gd}			9.5		

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=15V R_L=0.75Ω R_{GEN}=3Ω		9		ns
Turn-On Rise Time	t_r			6		
Turn-Off Delay Time	$t_{d(off)}$			52		
Turn-Off Fall Time	t_f			11.5		

Electrical Characteristic Curve

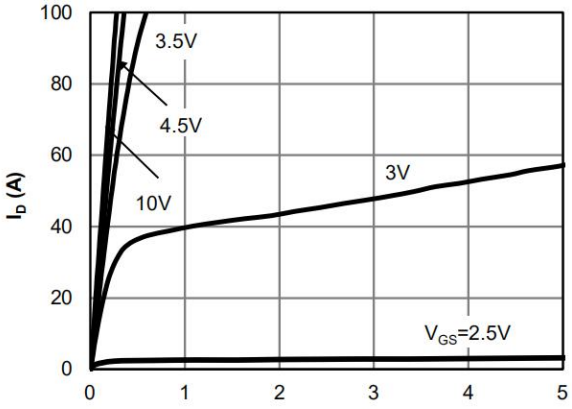


Figure 1: On-Region Characteristics

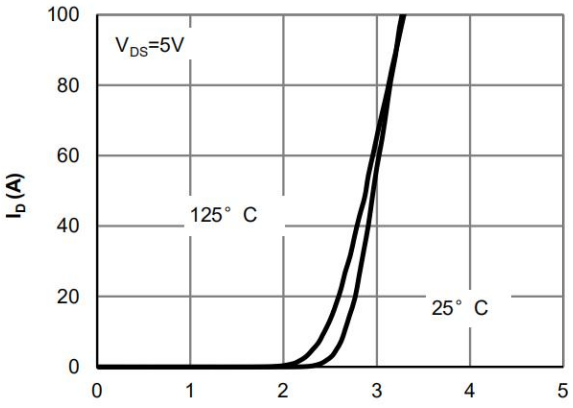


Figure 2: Transfer Characteristics

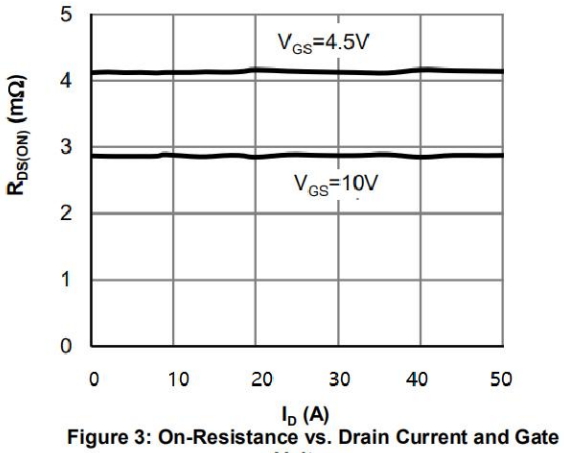


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

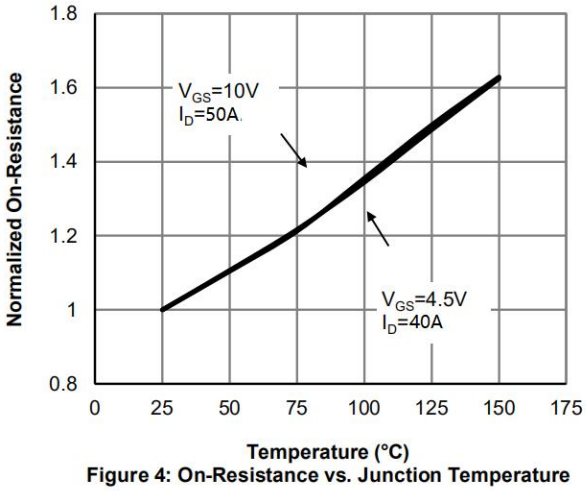


Figure 4: On-Resistance vs. Junction Temperature

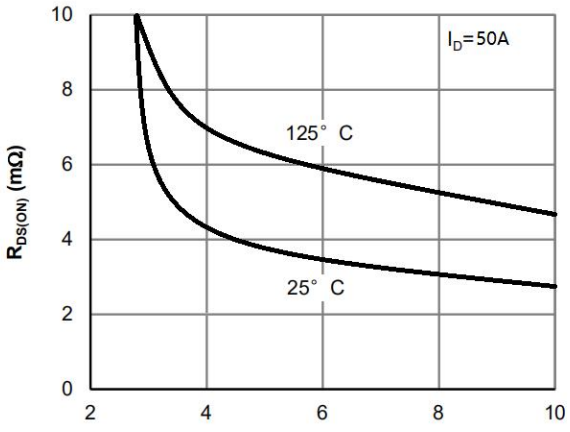


Figure 5: On-Resistance vs. Gate-Source Voltage

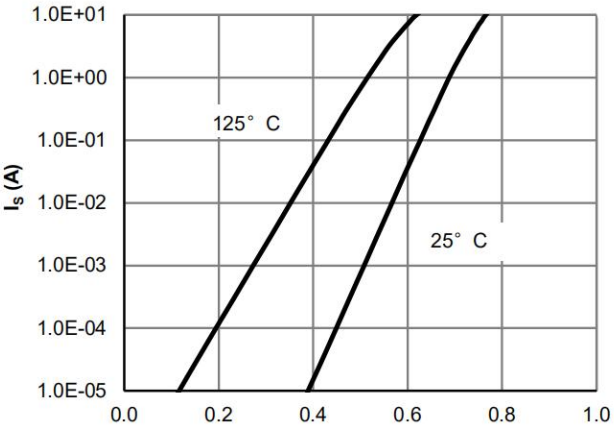


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

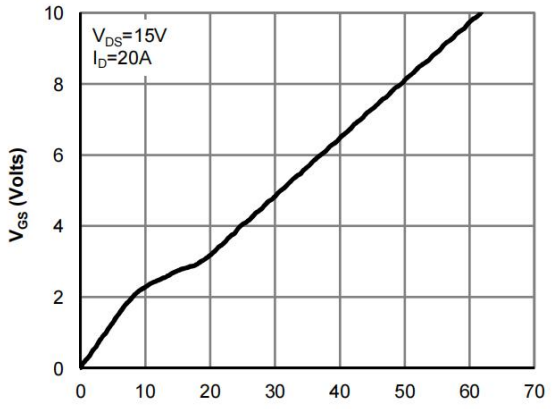


Figure 7: Gate-Charge Characteristics

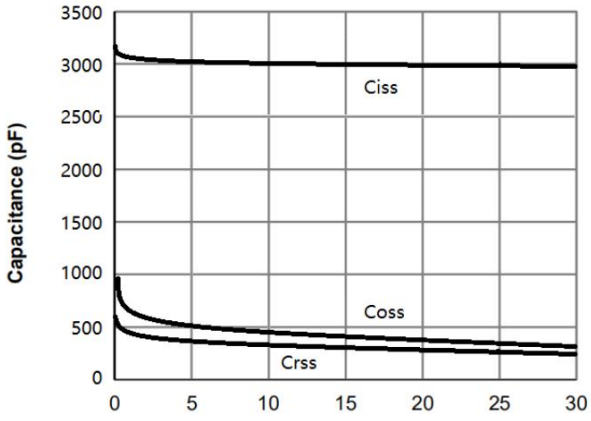
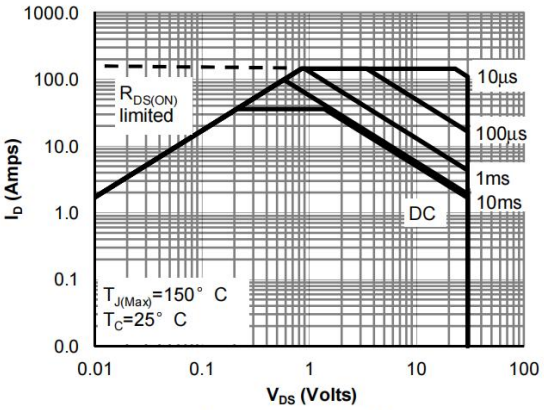


Figure 8: Capacitance Characteristics



V_{GS}> or equal to 4.5V
Figure 9: Maximum Forward Biased Safe Operating Area

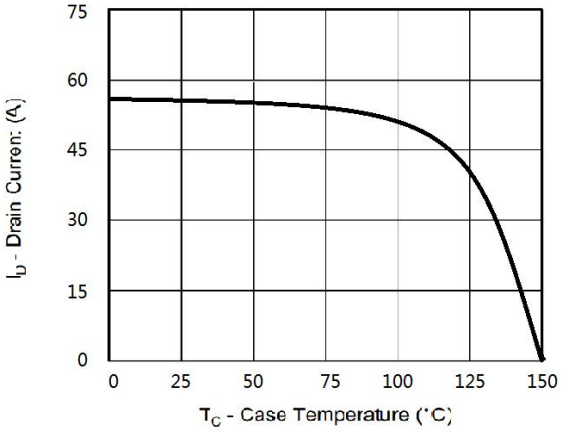


Figure10. Maximum Continuous Drain Current vs Case Temperature

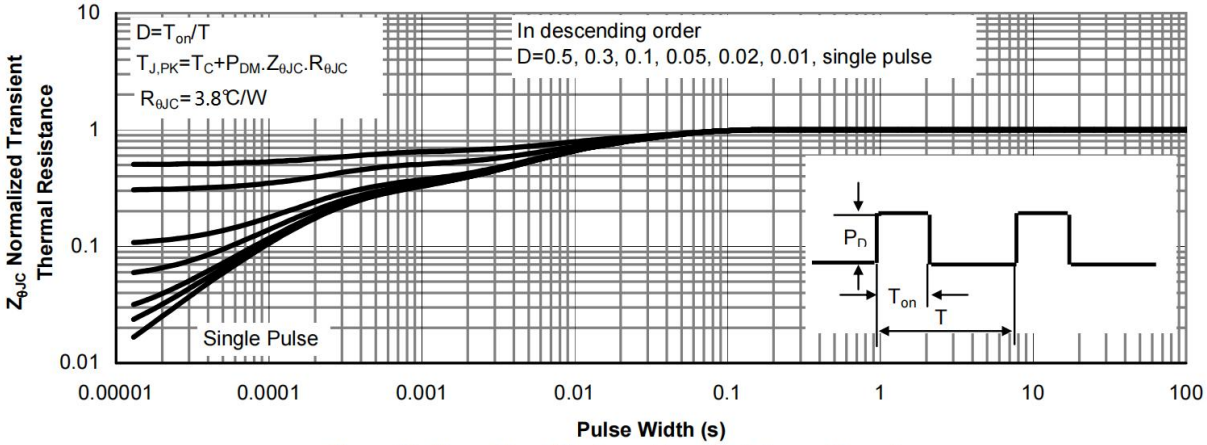
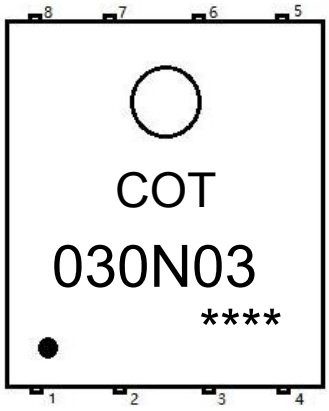


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:

COT: Company Logo

030N03: Product Type.

****: Lot No. Code, code change with Lot No.

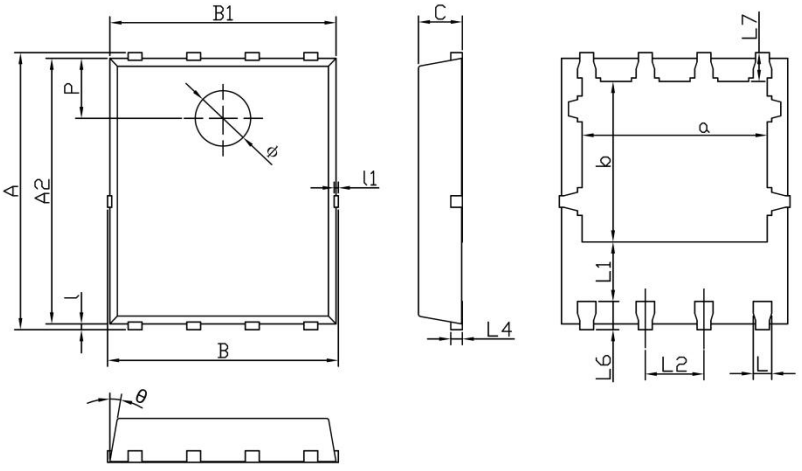
Packaging SPEC.

REEL INFORMATION

Package Type	Units					Dimension (unit: mm³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
PDFN5*6	5000	2	10000	6	60000	13'' × 12	360 × 360 × 50	380 × 335 × 366

Package Outline Dimensions

PDFN5×6 Unit:mm



Dimensions In Millimeters			
Symbol	MIN	TYP	MAX
A	5.90	6.00	6.10
a	3.91	4.01	4.11
A2	5.70	5.75	5.80
B	4.90	5.00	5.10
b	3.375	3.475	3.575
B1	4.80	4.90	5.00
C	0.90	0.95	1.00
L	0.30	0.40	0.50
l	0.06	0.13	0.20
L1	1.10	–	–
l1	–	–	0.10
L2	1.17	1.27	1.37
L4	0.21	0.26	0.34
L6	0.51	0.61	0.71
L7	0.51	0.61	0.71
P	1.15	1.30	1.45
θ	8°	10°	12°
ϕ	1.10	1.20	1.30

Rev.01 202209