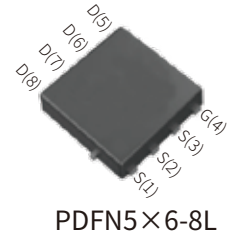


FEATURES

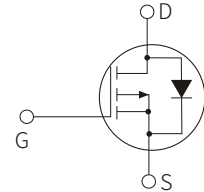
- Advanced trench cell design
- Low Thermal Resistance



PDFN5×6-8L

APPLICATION

- Motor drivers
- DC - DC Converter



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage $T_c=25^\circ\text{C}$	V_{DS}	-40	V
Pulsed Source Current $T_c=25^\circ\text{C}, V_{GS}=-10\text{V}$	I_{DM}^{***}	-200	A
Drain Current $V_{GS}=-10\text{V}$	I_D^*	$T_c=25^\circ\text{C}$ -70	A
		$T_c=100^\circ\text{C}$ -31.5	A
Gate-Source Voltage $T_c=25^\circ\text{C}$	V_{GS}	± 20	V
Total Power Dissipation $T_c=25^\circ\text{C}$	P_{tot}^*	37	W
Diode Forward Current $T_c=25^\circ\text{C}$	I_S	-70	A
Junction Temperature	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$
Single Pulsed Avalanche Energy $V_{DD} = -40\text{V}, L=0.1\text{mH}$	E_{AS}^*	312	mJ
Thermal Resistance- Junction to Ambient	$R_{\theta JA}^*$	56	$^\circ\text{C/W}$
Thermal Resistance- Junction to Case	$R_{\theta JC}^*$	3.3	$^\circ\text{C/W}$

Notes:

* Surface Mounted on 1 in² pad area, $t \leq 10$ sec

** Pulse width ≤ 300 us, duty cycle $\leq 2\%$

ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_{DS}=-250\mu A$	-40			V
Drain Leakage Current	I_{DSS}	$V_{DS}=-32V, V_{GS}=0V$			-1	μA
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1		-2	V
On-State Resistance	$R_{DS(on)}^a$	$V_{GS}=-10V, I_{DS}=-15A$		7.3	8.3	m Ω
		$V_{GS}=-4.5V, I_{DS}=-8A$		9.5	12	m Ω
Gate Charge Characteristics ^b						
Total Gate Charge	Q_g	$V_{DS}=-20V, V_{GS}=-10V, I_{DS}=-15A$		77		nC
Gate- Source Charge	Q_{GS}			6.9		nC
Gate- Drain Charge	Q_{gd}			15		nC
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -20V, V_{GEN} = -10V,$ $R_G = 3.9\Omega, R_L = 1.33\Omega,$ $I_{DS} = -15A$		9		nS
Turn-On Rise Time	t_r			3.5		nS
Turn-Off Delay Time	$t_{d(off)}$			34		nS
Turn-Off Fall Time	t_f			3		nS
Input Capacitance	C_{iss}	$V_{DS}=-20V, V_{GS}=0V$ Frequency = 1 MHz		3351		pF
Output Capacitance	C_{oss}			300		pF
Reverse Transfer Capacitance	C_{rss}			258		pF
Diode Characteristics						
Diode Forward Voltage	V_{SD}^a	$I_{SD} = -15A, V_{GS} = 0V$			-1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS} = -15A, V_{GS} = 0V$ $dI_{SD} / dt = 100A/\mu s$		18		nS
Reverse Recovery Charge	Q_{rr}			11		nC

Notes:

a: Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

b: Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

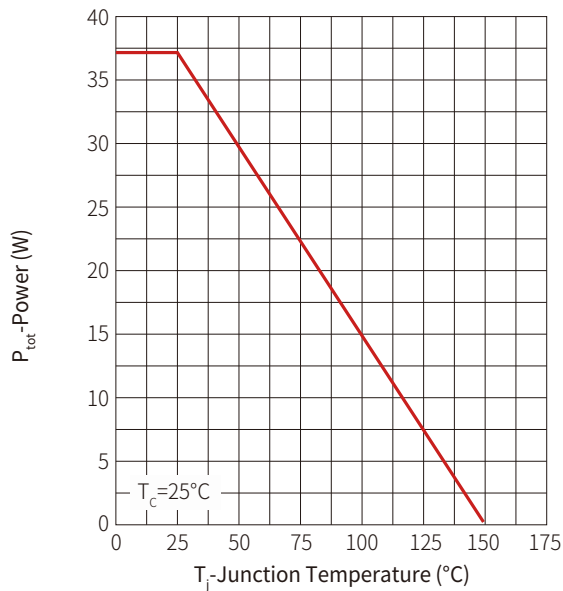


Figure2: Current Capability

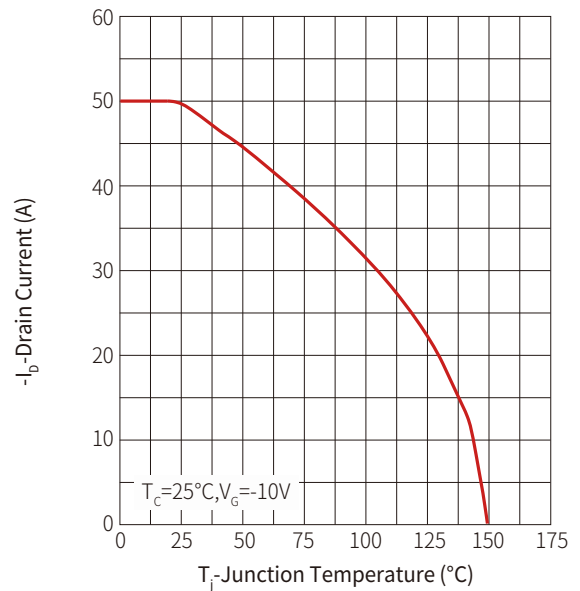


Figure3: Safe Operation Area

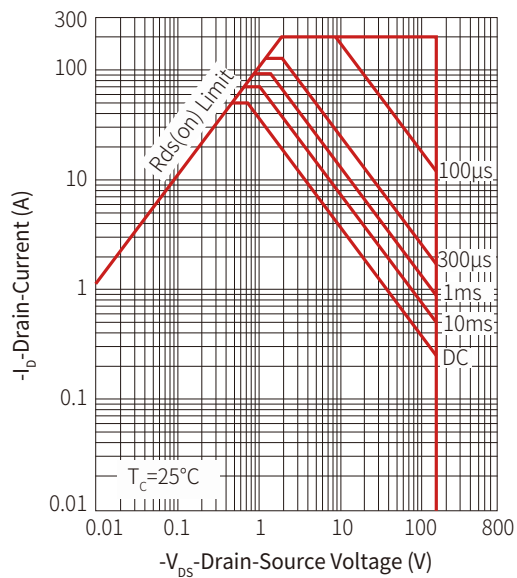


Figure 4: Transient Thermal Impedance

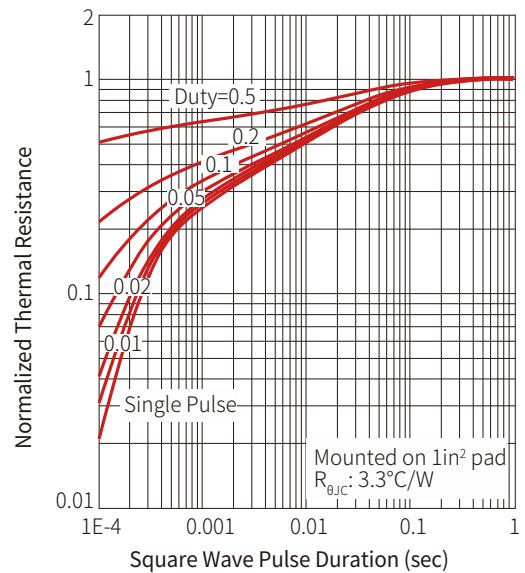


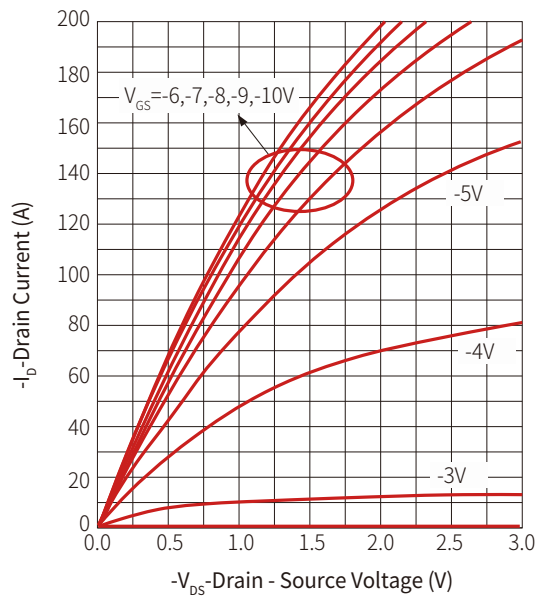
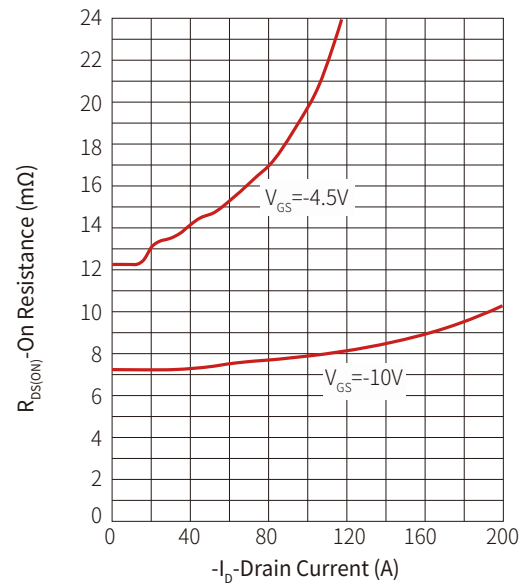
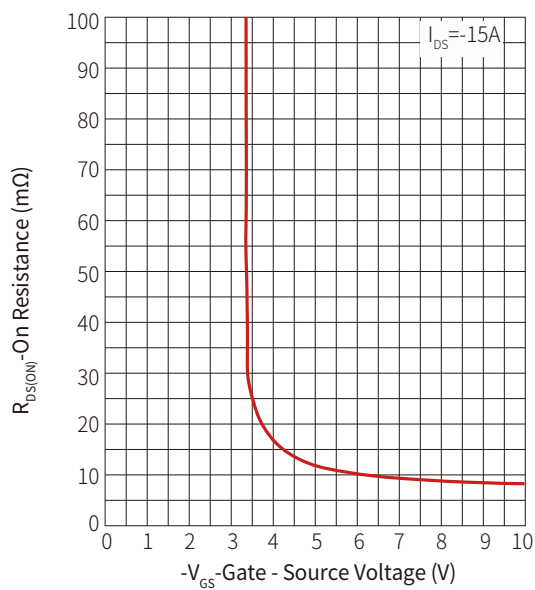
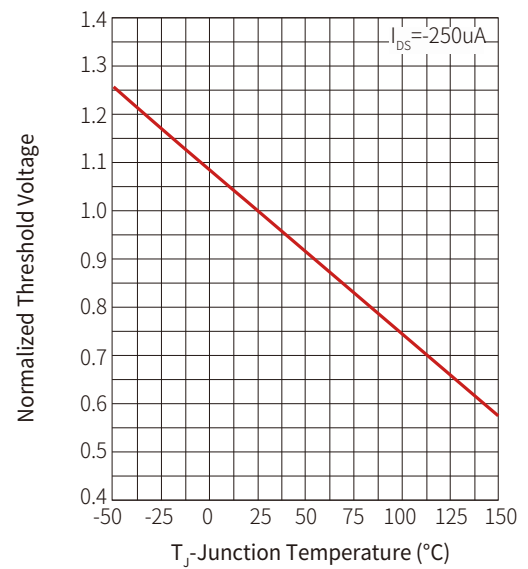
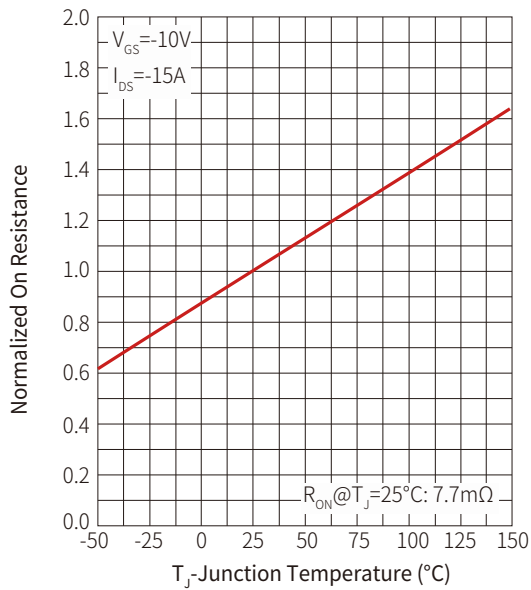
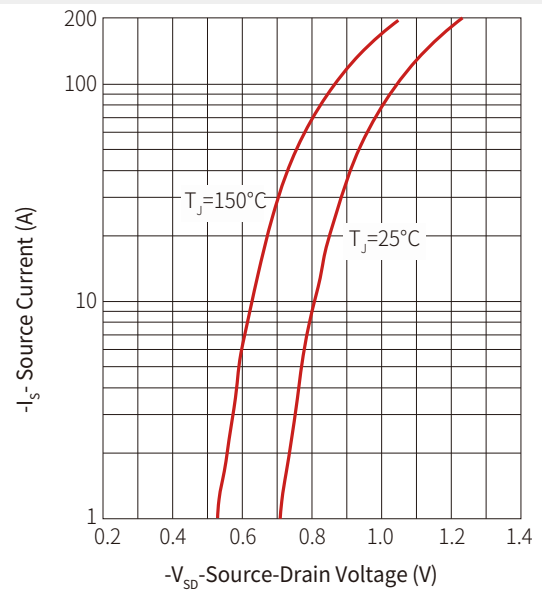
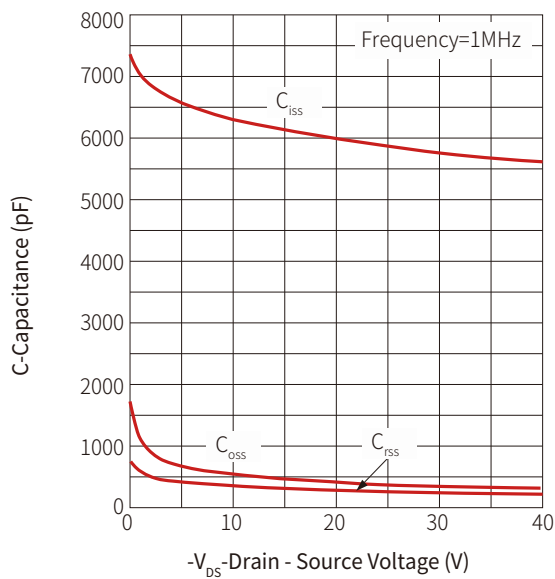
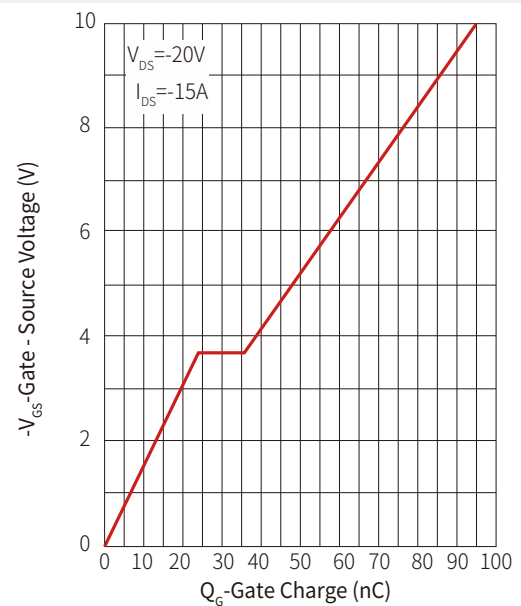
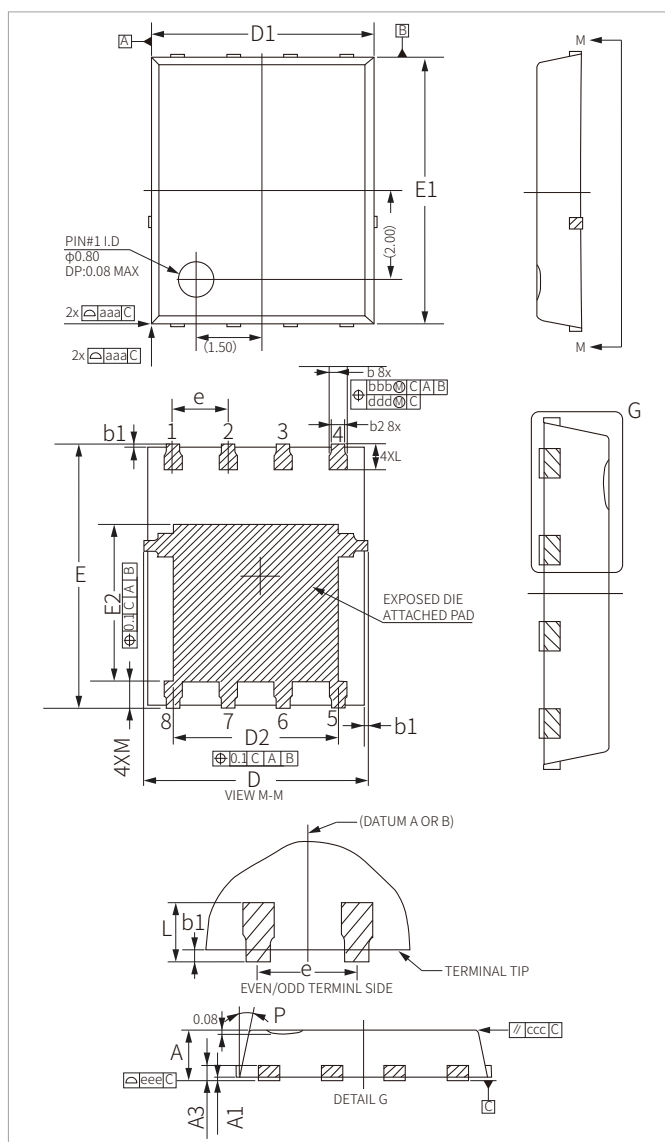
Figure 5: Output Characteristics

Figure 6: Drain-Source On Resistance

Figure 7: Transfer Characteristics

Figure 8: Normalized Threshold Voltage


Figure 9: Normalized On Resistance

Figure 10: Diode Forward Current

Figure 11: Capacitance

Figure 12: Gate Charge


PDFN5×6-8L PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.17	0.035	0.046
A1	0.00	0.05	0.000	0.002
A3	0.254REF		0.010REF	
b	0.31	0.51	0.012	0.020
b1	0.03	0.13	0.001	0.005
b2	0.21	0.41	0.008	0.016
D	5.15BSC		0.203BSC	
D1	5.00BSC		0.197BSC	
D2	3.70	3.90	0.146	0.154
E	6.15BSC		0.242BSC	
E1	6.00BSC		0.236BSC	
E2	3.56	3.76	0.140	0.148
e	1.27BSC		0.050BSC	
L	0.51	0.71	0.020	0.028
M	0.51	0.71	0.020	0.028
P	10°	12°	0.394°	0.472°
aaa	0.10		0.004	
bbb	0.10		0.004	
ccc	0.10		0.004	
ddd	0.05		0.002	
eee	0.08		0.003	

ORDERING INFORMATION

Part Number	Component Package	Marking	QTY/Reel	Reel Size
SPM70P04G	PDFN5×6-8L	070P04 XXXXXX	5000PCS	13"

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