

FEATURES

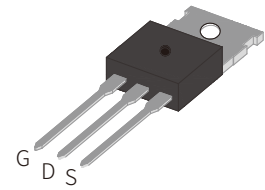
- | Low gate charge
- | Advanced trench cell design

APPLICATION

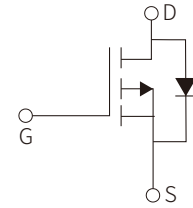
- | LCD TV appliances
- | LCDM appliances
- | High power inverter system

APPROVALS

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



TO-220C



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit	
Drain-Source Voltage $T_c=25^\circ\text{C}$	V_{DS}	-40	V	
Gate-Source Voltage $T_c=25^\circ\text{C}$	V_{GS}	± 20	V	
Drain Current (DC) , $V_{GS}=-10\text{ V}$	$I_D^{*,***}$	$T_c=25^\circ\text{C}$	-180	A
		$T_c=100^\circ\text{C}$	-166	A
Drain Current (Pulsed) * $T_c=25^\circ\text{C}$, $V_{GS}=-10\text{ V}$	I_{DM}^*	-700	A	
Continuous-Source Current $T_c=25^\circ\text{C}$	I_S	-180	A	
Drain power dissipation $T_c=25^\circ\text{C}$	P_{tot}	300	W	
Single Pulsed Avalanche Current $V_{DD}=-40\text{V}$, $L=0.1\text{mH}$	I_{AS}	-110	A	
Single Pulsed Avalanche Energy $V_{DD}=-40\text{V}$, $L=1.0\text{mH}$	E_{AS}	612	mJ	
Thermal Resistance- Junction to Ambient	$R_{\theta JA}^{**}$	42	$^\circ\text{C/W}$	
Thermal Resistance- Junction to Case	$R_{\theta JC}^{**}$	0.5	$^\circ\text{C/W}$	
Junction Temperature	T_J	175	$^\circ\text{C}$	
Storage Temperature	T_{STG}	-55 to 175	$^\circ\text{C}$	

Notes:

* Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

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

*** Limited by bonding wire

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA	-40			V
Drain Leakage Current	I _{DSS}	V _{DS} =-32V, V _{GS} =0V			-1	μA
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1		-2.5	V
On-State Resistance	R _{DS(on)} ^a	V _{GS} =-10V, I _{DS} =-50A			3.0	mΩ
		V _{GS} =-4.5V, I _{DS} =-30A			5.0	mΩ
Gate Charge Characteristics^b						
Total Gate Charge	Q _g	V _{DS} =-20V, V _{GS} =-10V, I _{DS} =-20A		276		nC
Gate- Source Charge	Q _{gs}			65		nC
Gate- Drain Charge	Q _{gd}			35		nC
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DS} = - 20 V, V _{GEN} = - 10 V, R _G = 3.9 Ω, R _L = 0.4 Ω, I _{DS} = - 50 A		18		nS
Turn-On Rise Time	t _r			124		nS
Turn-Off Delay Time	t _{d(off)}			337		nS
Turn-Off Fall Time	t _f			140		nS
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V Frequency = 1 MHz		16177		pF
Output Capacitance	C _{oss}			1067		pF
Reverse Transfer Capacitance	C _{rss}			301		pF
Diode Characteristics						
Diode Forward Voltage	V _{SD} ^a	I _{SD} = -50A, V _{GS} = 0V			-1.3	V
Reverse Recovery Time	t _{rr}	I _{DS} = - 50 A, V _{GS} = 0V di _{SD} / dt = 100A/μs		28		nS
Reverse Recovery Charge	Q _{rr}				26	

Notes:

a: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%

b: Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

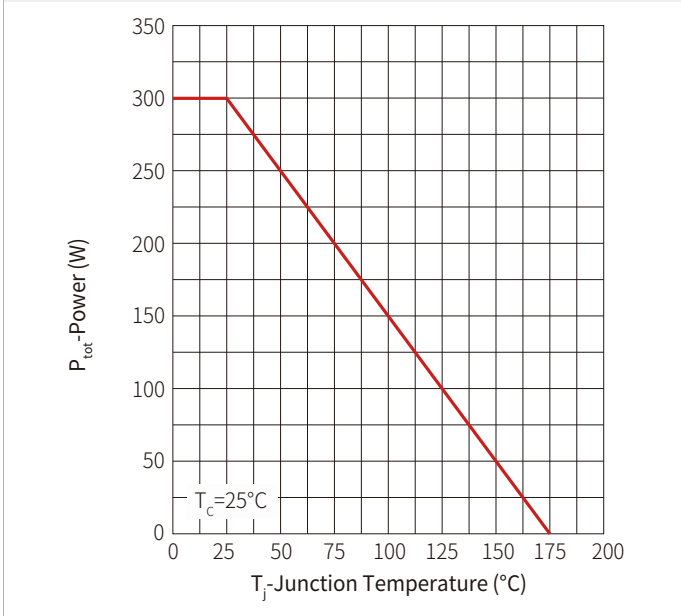


Figure2: Current Capability

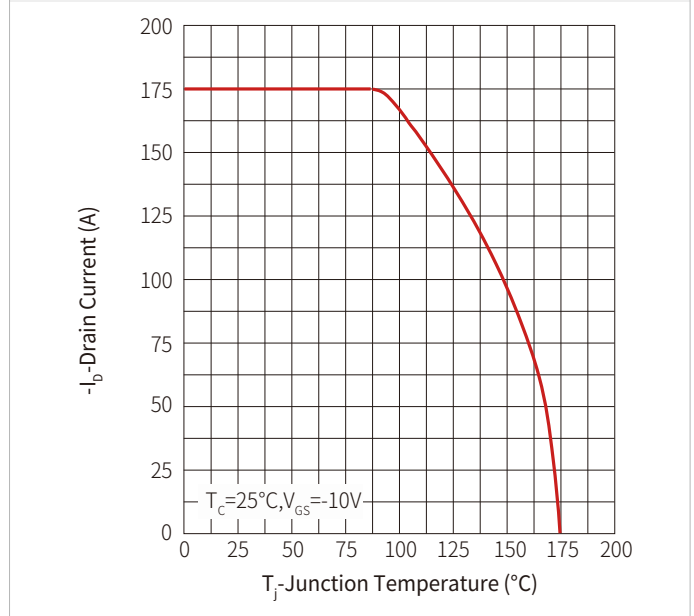


Figure3: Safe Operation Area

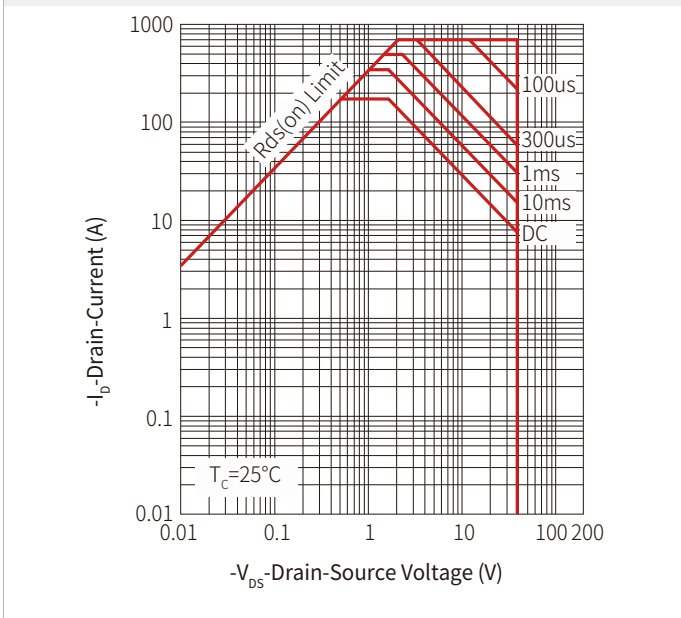


Figure 4: Transient Thermal Impedance

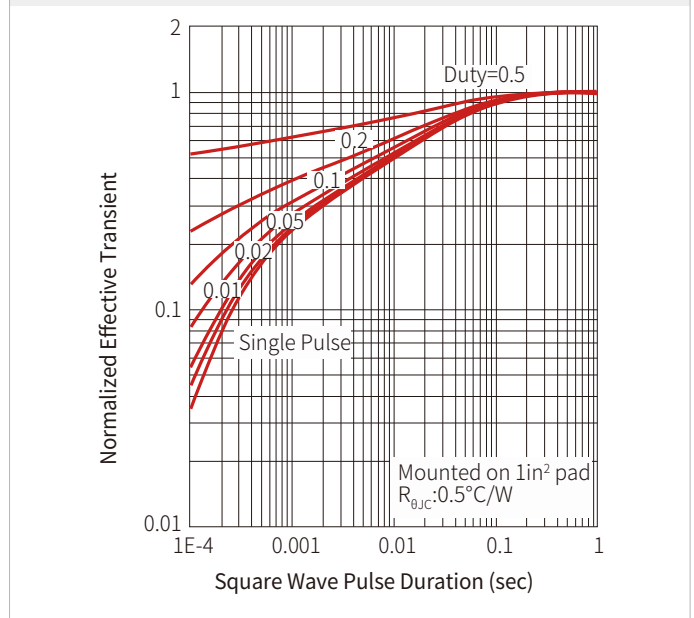


Figure5 :Output Characteristics

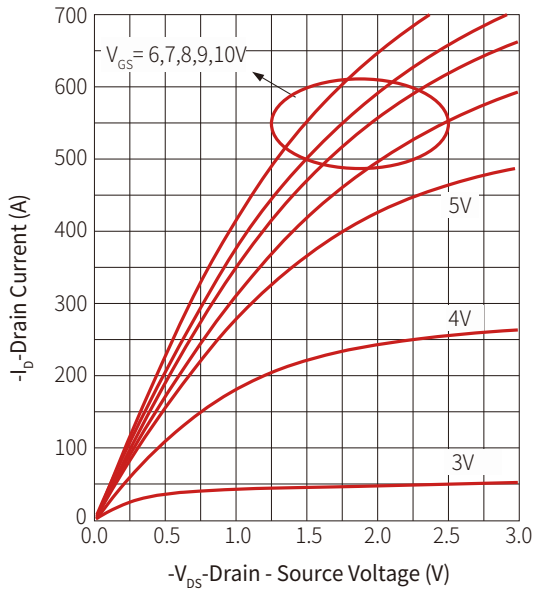


Figure6 :On Resistance

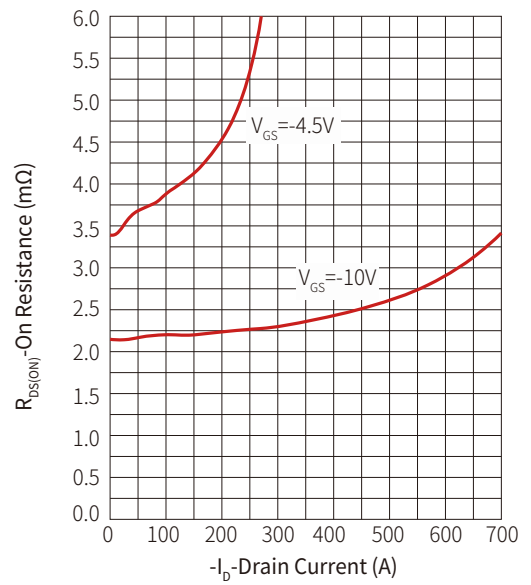


Figure7 :Transfer Characteristics

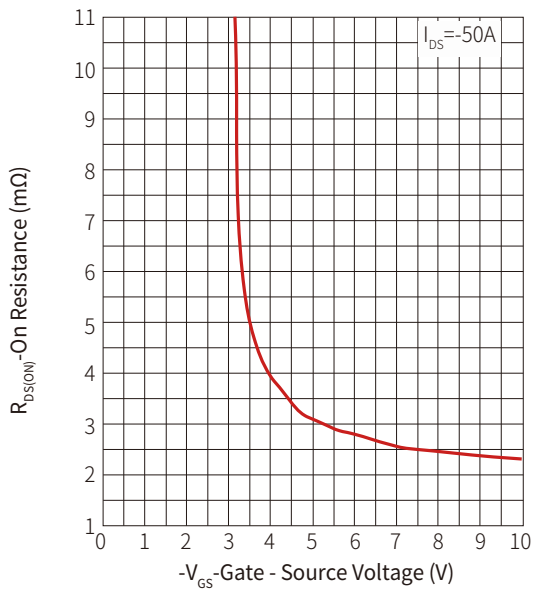


Figure8 : Normalized Threshold Voltage

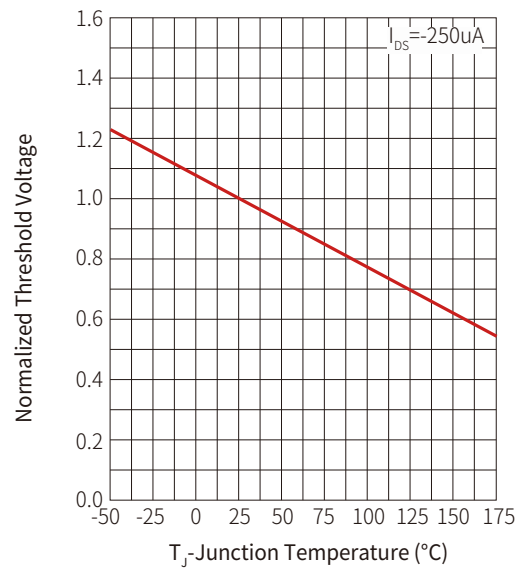


Figure9 :Normalized On Resistance

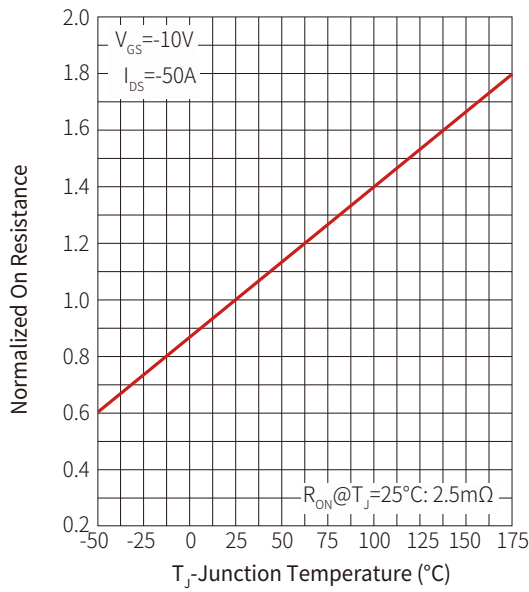


Figure10 : Diode Forward Current

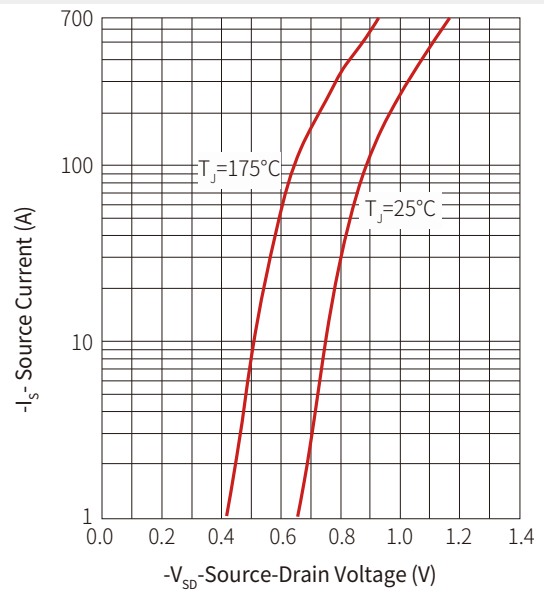


Figure11 :Capacitance

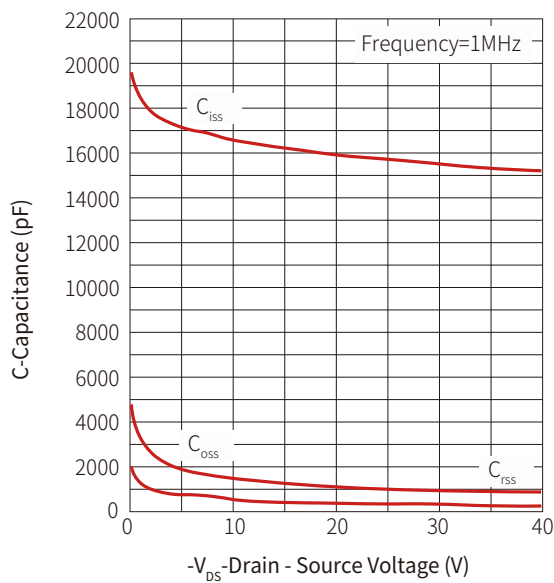
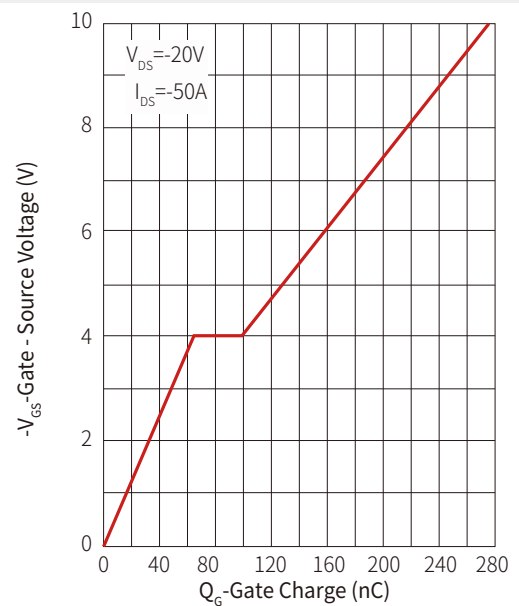
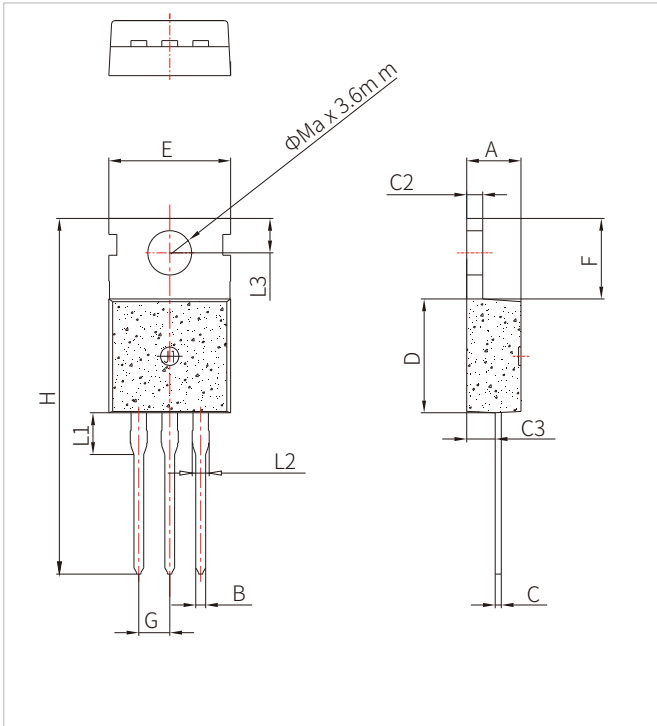


Figure12 : Gate Charge




TO-220C PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.70	0.169		0.185
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.80		10.0	0.346		0.394
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		30.0	1.102		1.181
L1		3.10			0.122	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

ORDERING INFORMATION

Part Number	Marking	Package	Qty/pcs		
			Tube	Inner Box	Carton
SPMC200P04	 SPMC200P04 XXXX	TO-220C	50	1000	5000

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