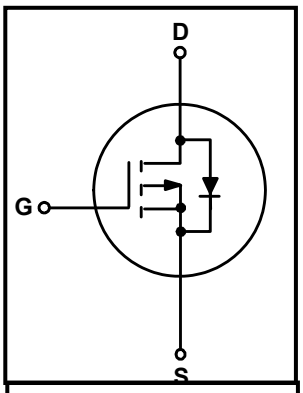
P-Channel Enhancement Mode MOSFET

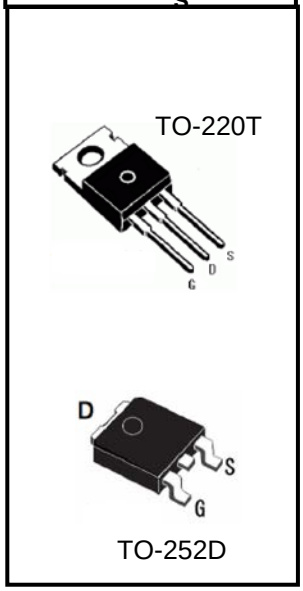


FEATURES

- Super Low Gate Charge
- 100% EAS Guaranteed
- RoHS compliant
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

APPLICATIONS

- Motor driver appliances
- Adapter appliances
- High powerinverter system



Device Marking and Package Information		
Device	**Package**	**Marking**
SR20P10D	TO-252-2L	SR20P10D
SR20P10T	TO-220-3L	SR20P10T

Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	-100	-	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D	Drain Current (DC)	T_C = 25 ℃, V_{GS} = -10 V	-	- 15	A
I_{DM}*	Drain Current (Pulsed) *	T_C = 25 ℃, V_{GS} = -10 V	-	- 44	A
P_{tot}	Drain power dissipation	T_C = 25 ℃	-	35	W
T_{stg}	Storage Temperature		-55	150	℃
T_J	Junction Temperature		-	150	℃
I_S	Diode Forward Current	T_C = 25 ℃	-	- 15	A
$R_{\theta JA}$**	Thermal Resistance- Junction to Ambient		-	37	℃/W
$R_{\theta JC}$***	Thermal Resistance- Junction to Case		-	1.2	

Notes：

* Pulse width ≤ 300 μs, duty cycle ≤ 2 %

** Mounted on PCB of 1 in^2 pad area

*** Mounted on Large Heat Sink

Electrical Characteristics (T_A=25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_{DS} = - 250 μA	- 100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = - 250 μA	- 1.0	- 1.8	- 2.5	V
I_{DSS}	Drain Leakage Current	V_{DS} = - 80V, V_{GS} = 0 V	-	-	- 1.0	μA
I_{GSS}	Gate Leakage Current	V_{GS} = 0 V, V_{GS} = ± 20 V	-	-	±100	nA
$R_{DS(ON)}$[a]	On-State Resistance	V_{GS} = - 10 V, I_{DS} = - 1 A	-	160	200	mΩ
		V_{GS} = - 4.5 V, I_{DS} = - 1 A	-	170	220	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = - 0.5 A, V_{GS} = 0 V	-	- 0.7	- 1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = - 6 A, dI_{SD} / dt = 100 A / μs	-	40	-	nS
Q_{rr}	Reverse Recovery Charge		-	28	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = - 50 V Frequency = 1 MHz	-	1545	-	pF
C_{oss}	Output Capacitance		-	37	-	
C_{rss}	Reverse Transfer Capacitance		-	25	-	
t_d(on)	Turn-on Delay Time	V_{DS} = - 50 V, V_{GEN} = - 10 V, R_G = 4.5 Ω, R_L = 25 Ω, I_{DS} = - 2 A	-	10	-	nS
t_r	Turn-on Rise Time		-	27	-	
t_d(off)	Turn-off Delay Time		-	288	-	
t_f	Turn-off Fall Time		-	88	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{DS} = - 50 V, V_{GS} = - 10 V, I_{DS} = - 2 A	-	27	-	nC
Q_{gs}	Gate-Source Charge		-	5.3	-	
Q_{gd}	Gate-Drain Charge		-	3.2	-	

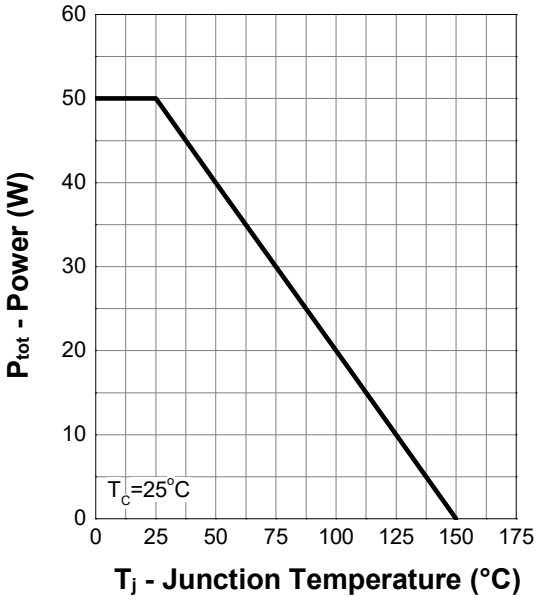
Notes：

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

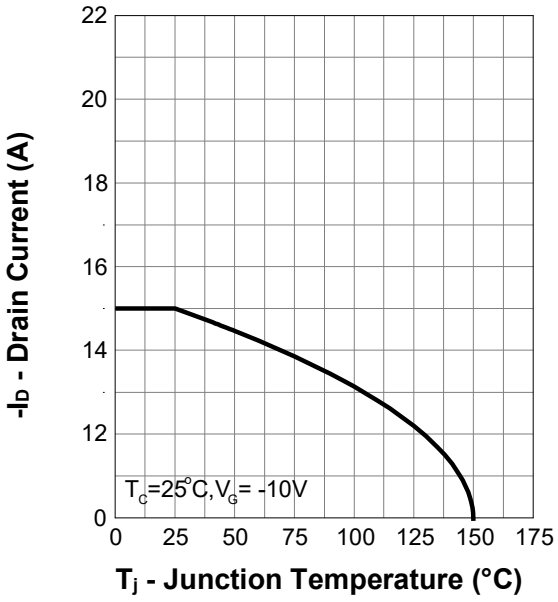
b: Guaranteed by design, not subject to production testing

Typical Characteristics (Cont.)

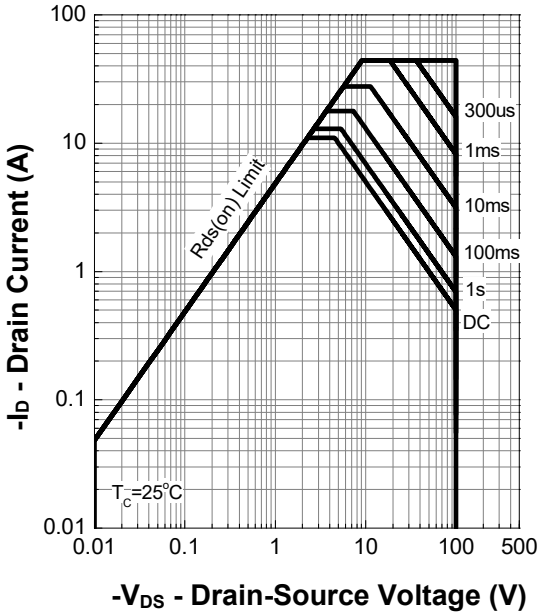
Power Capability



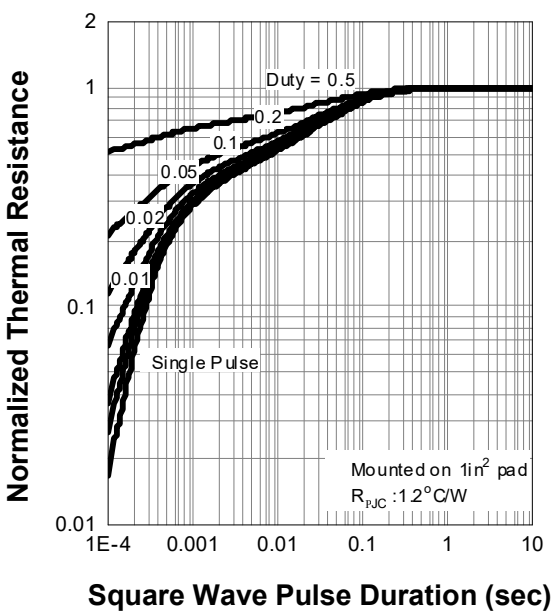
Current Capability



Safe Operation Area

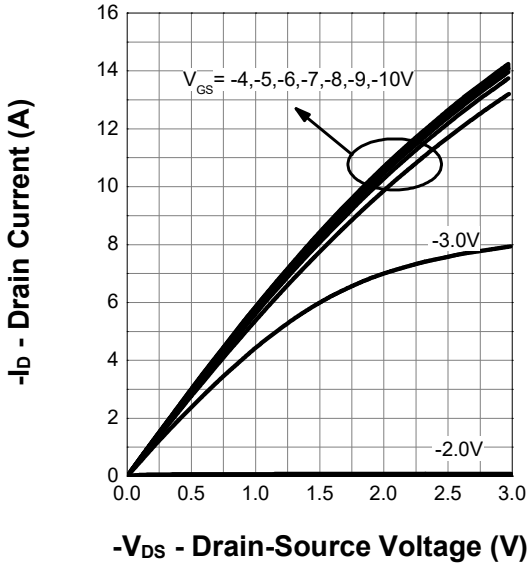


Transient Thermal Impedance

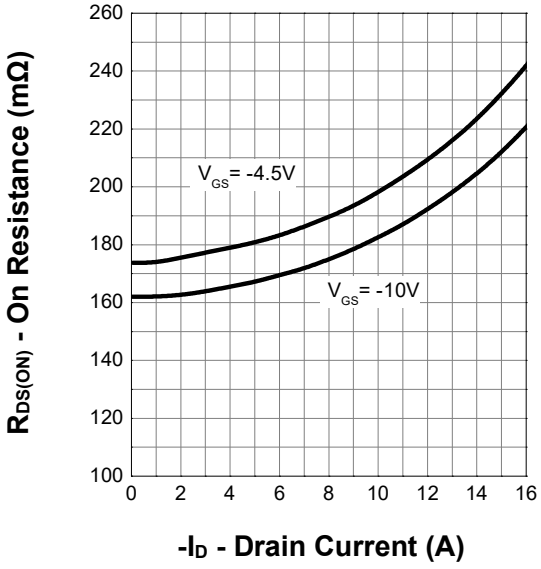


Typical Characteristics (Cont.)

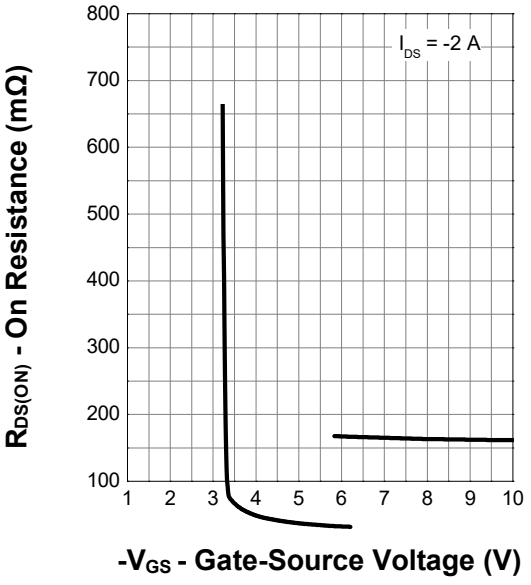
Output Characteristics



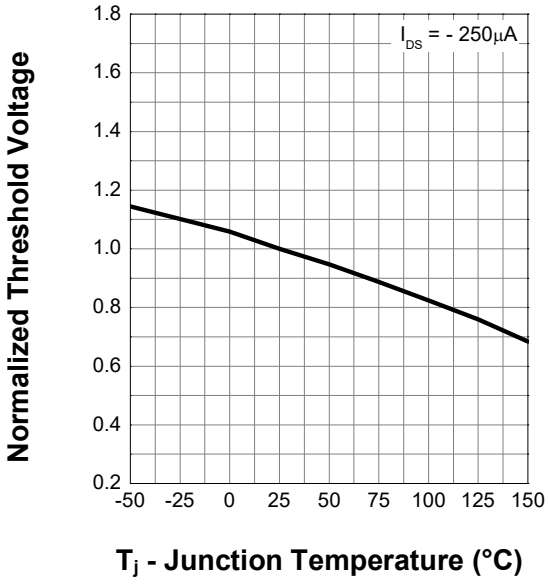
Drain-Source On Resistance



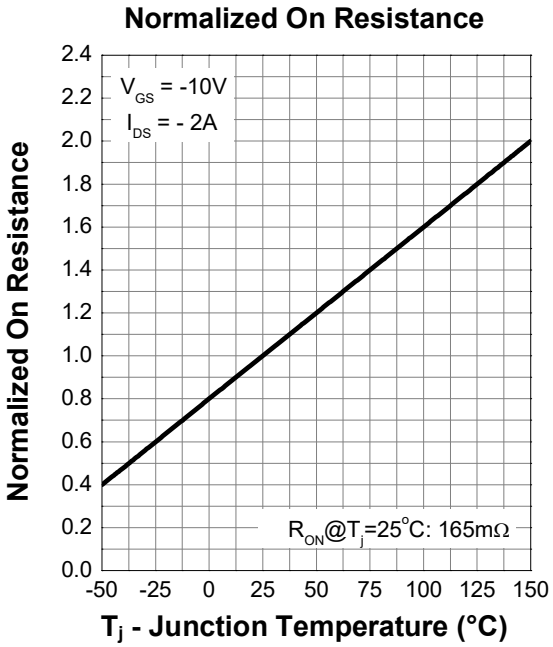
Transfer Characteristics

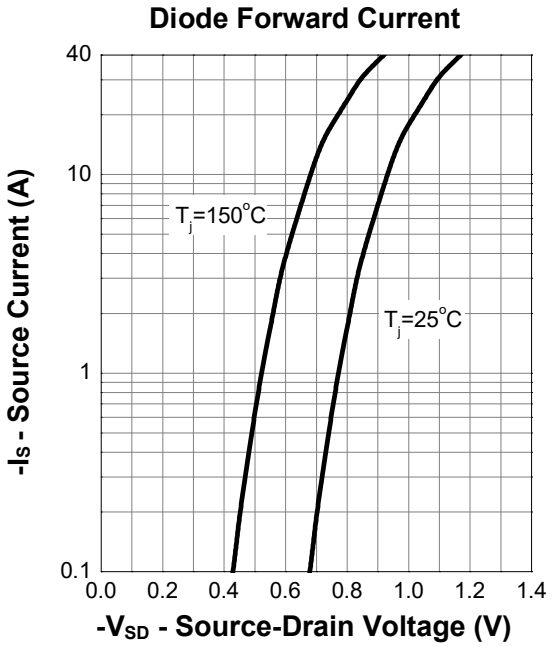


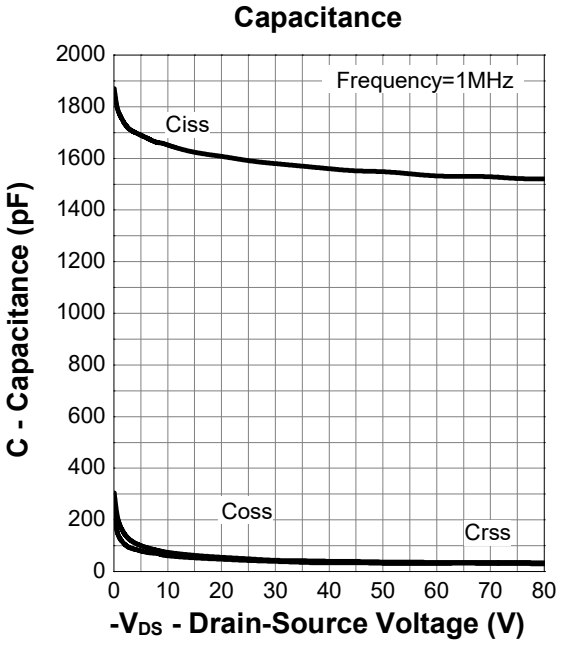
Normalized Threshold Voltage

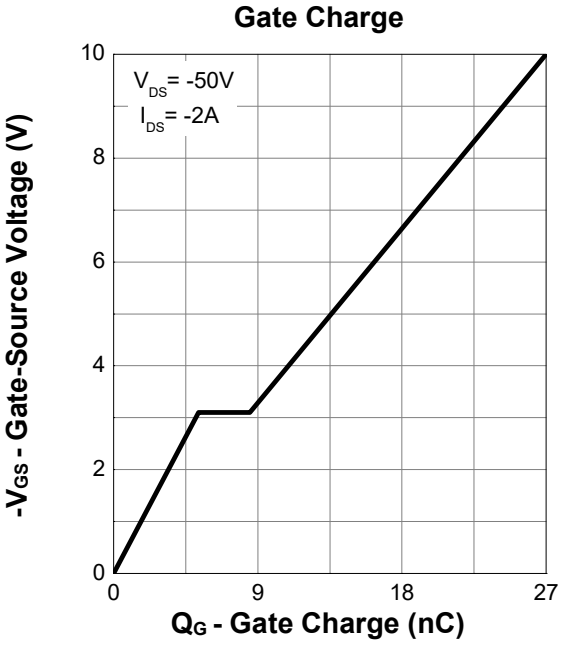


Typical Characteristics (Cont.)





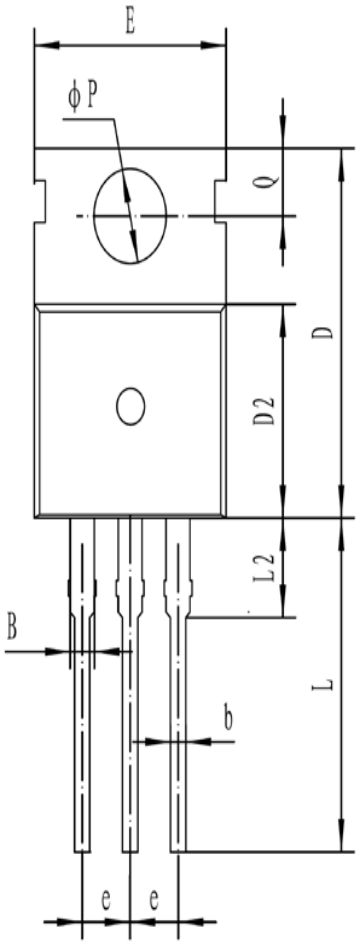


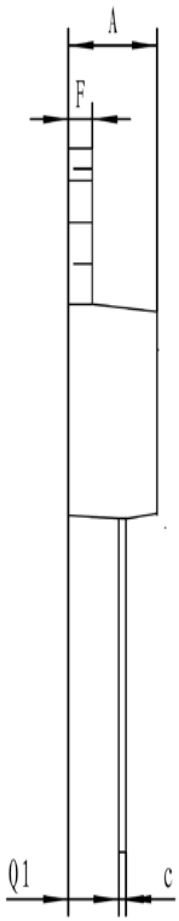


PACKAGE MECHANICAL DATA

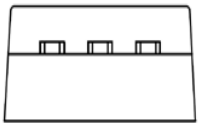
TO-220T

Unit





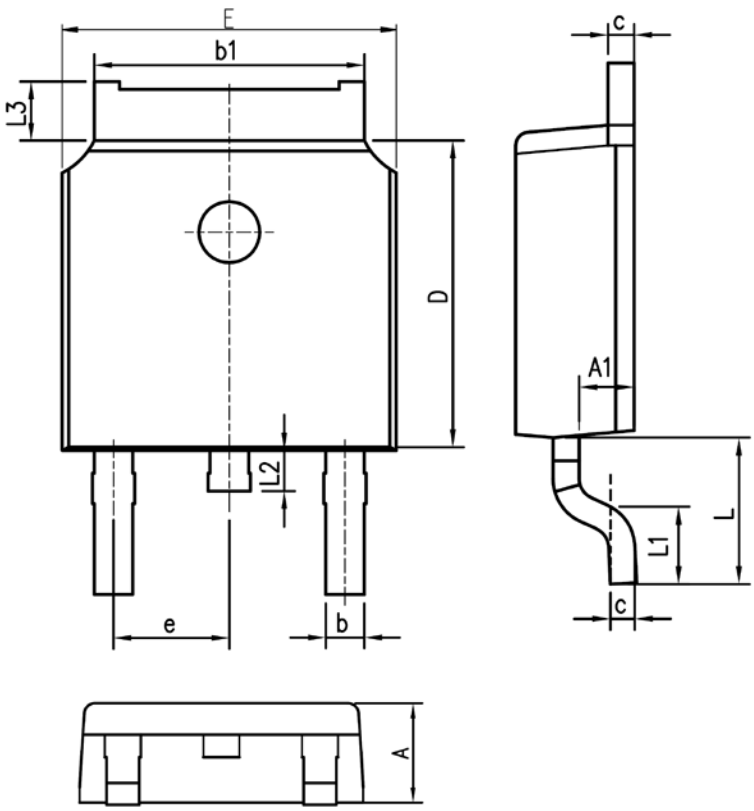
符号 symbol	MIN	MAX
A	4.30	4.70
B	1.10	1.40
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80



PACKAGE MECHANICAL DATA

DPAK TO-252

Unit



SYMBOL	mm	
	MIN	MAX
A	2.10	2.50
A1	0.97	1.17
b	0.63	0.93
b1	5.13	5.53
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
e	2.286BSC	
L	2.50	3.30
L1	1.20	1.80
L2	0.60	1.00
L3	0.85	1.30