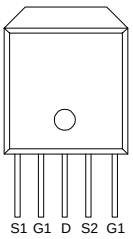
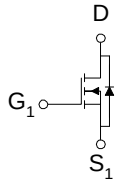
# P & N-Channel 30-V (D-S) MOSFET

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

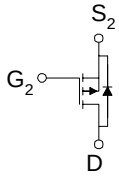
| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DS}$ (V) | $r_{DS(on)}$ m(Ω) | $I_D$ (A) |
| 30 | 45 @ $V_{GS}$ = 2.5V | 29 |
| | 35 @ $V_{GS}$ = 4.5V | 36 |
| -26.5 | 70 @ $V_{GS}$ = -2.5V | -20 |
| | 52 @ $V_{GS}$ = -4.5V | -26 |

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe DPAK saves board space
- Fast switching speed
- High performance trench technology



N-Channel MOSFET



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25 °C UNLESS OTHERWISE NOTED) | | | | | |
|---|---|---|---|---|---|
| **Parameter** | | **Symbol** | **N-Channel** | **P-Channel** | **Units** |
| Drain-Source Voltage | | $V_{DS}$ | 30 | -26.5 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | ±12 | |
| Continuous Drain Current[a] | $T_A$=25°C | $I_D$ | 36 | -26 | A |
| | $T_A$=70°C | | 30 | -21 | |
| Pulsed Drain Current[b] | | $I_{DM}$ | 40 | -40 | |
| Continuous Source Current (Diode Conduction)[a] | | $I_S$ | 30 | -30 | A |
| Power Dissipation[a] | $T_A$=25°C | $P_D$ | 50 | 50 | W |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | -55 to 175 | | °C |

| THERMAL RESISTANCE RATINGS | | | |
|---|---|---|---|
| **Parameter** | **Symbol** | **Maximum** | **Units** |
| Maximum Junction-to-Ambient[a] | $R_{\theta JA}$ | 50 | °C/W |
| Maximum Junction-to-Case | $R_{\theta JC}$ | 3.0 | °C/W |

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

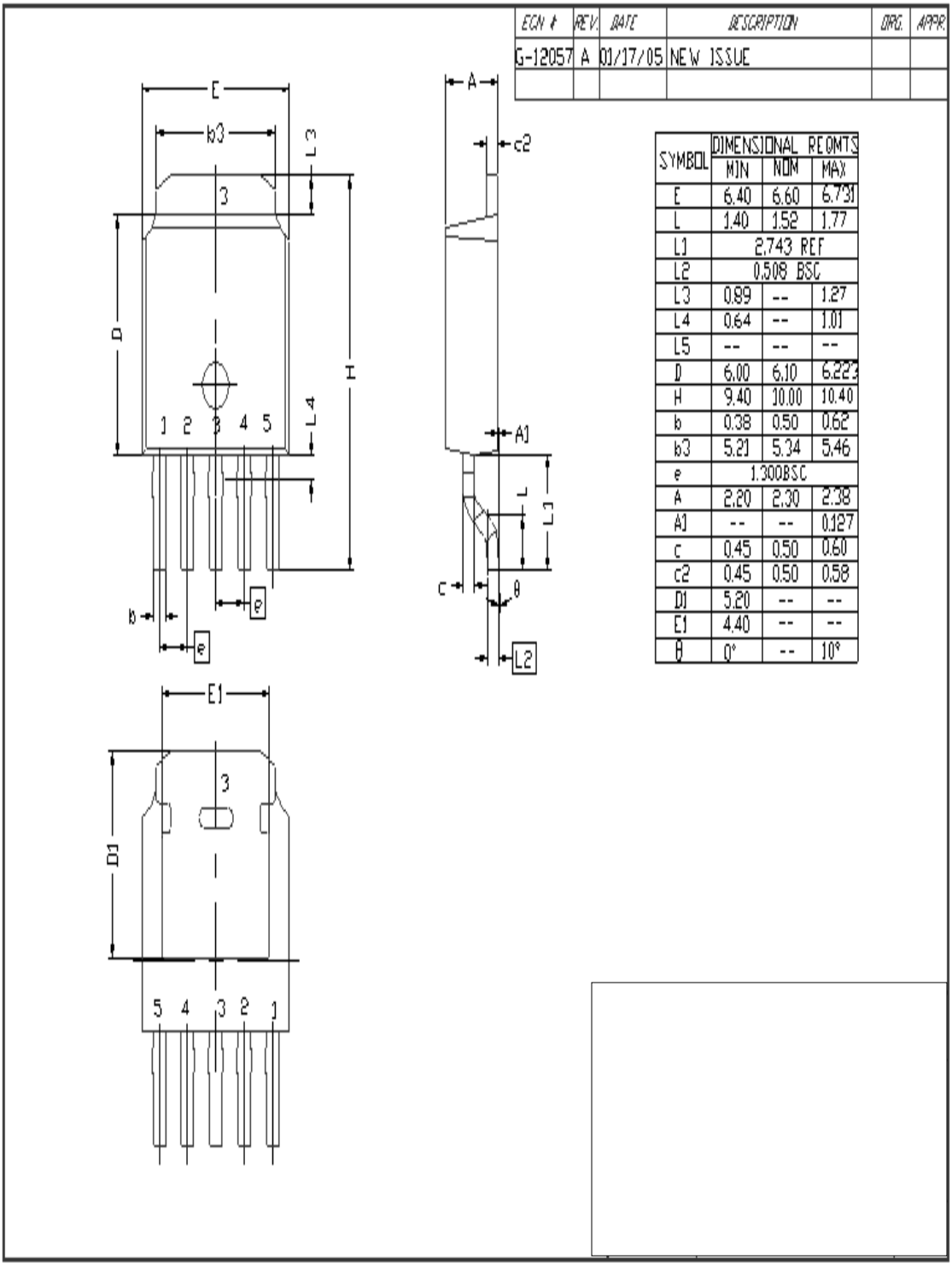
b. Pulse width limited by maximum junction temperature

| SPECIFICATIONS ($T_A$ = 25°C UNLESS OTHERWISE NOTED) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Parameter** | **Symbol** | **Test Conditions** | **Limits** | | | | **Unit** |
| | | | **Ch** | **Min** | **Typ** | **Max** | |
| **Static** | | | | | | | |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 250 uA | N | 0.6 | | | V |
| | | $V_{GS}$ = $V_{DS}$, $I_D$ = -250 uA | P | -0.6 | | | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{GS}$ = -12 V, $V_{DS}$ = 0 V | P | | | ±100 | nA |
| | | $V_{GS}$ = 12 V, $V_{DS}$ = 0 V | N | | | ±100 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = -24 V, $V_{GS}$ = 0 V | P | | | -1 | uA |
| | | $V_{DS}$ = 24 V, $V_{GS}$ = 0 V | N | | | 1 | |
| On-State Drain Current[A] | $I_{D(on)}$ | $V_{DS}$ = 5 V, $V_{GS}$ = 4.5 V | N | 20 | | | A |
| | | $V_{DS}$ = -5 V, $V_{GS}$ = -4.5 V | P | -20 | | | |
| Drain-Source On-Resistance[A] | $r_{DS(on)}$ | VGS = 4.5 V, $I_D$ = 6.9 A | N | | | 35 | mΩ |
| | | VGS = 2.5 V, $I_D$ = 6 A | | | | 45 | |
| | | VGS = -4.5 V, $I_D$ = -5.2 A | P | | | 52 | |
| | | VGS = -2.5 V, $I_D$ = -4.2 A | | | | 70 | |
| Forward Tranconductance[A] | $g_{fs}$ | $V_{DS}$ = 15 V, $I_D$ = 6.9 A | N | | 25 | | S |
| | | $V_{DS}$ = -15 V, $I_D$ = -5.2 A | P | | 10 | | |
| **Dynamic** | | | | | | | |
| Total Gate Charge | $Q_g$ | N-Channel $V_{DS}$=15V, $V_{GS}$=4.5V, $I_D$=6.9A P-Channel $V_{DS}$=-15V, $V_{GS}$=-4.5V, $I_D$=-5.2A | N | | 6.0 | | nC |
| | | | P | | 25 | | |
| Gate-Source Charge | $Q_{gs}$ | | N | | 1.0 | | |
| | | | P | | 2.4 | | |
| Gate-Drain Charge | $Q_{gd}$ | | N | | 1.5 | | |
| | | | P | | 3.9 | | |
| Turn-On Delay Time | $t_{d(on)}$ | N-Chaneel $V_{DD}$=15V, $V_{GS}$=4.5V, $I_D$=1A , $R_{GEN}$=6Ω, P-Channel $V_{DD}$=-15V, $V_{GS}$=-4.5V, $I_D$=-1A $R_{GEN}$=6Ω | N | | 7.4 | | nS |
| | | | P | | 7.6 | | |
| Rise Time | $t_r$ | | N | | 4 | | |
| | | | P | | 6.8 | | |
| Turn-Off Delay Time | $t_{d(off)}$ | | N | | 22.2 | | |
| | | | P | | 33.6 | | |
| Fall-Time | $t_f$ | | N | | 3.6 | | |
| | | | P | | 23.2 | | |

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.




| SYMBOL | DIMENSIONAL REQMTS | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| E | 6.40 | 6.60 | 6.731 |
| L | 1.40 | 1.52 | 1.77 |
| L1 | 2.743 REF | | |
| L2 | 0.508 BSC | | |
| L3 | 0.89 | -- | 1.27 |
| L4 | 0.64 | -- | 1.01 |
| L5 | -- | -- | -- |
| D | 6.00 | 6.10 | 6.223 |
| H | 9.40 | 10.00 | 10.40 |
| b | 0.38 | 0.50 | 0.62 |
| b3 | 5.21 | 5.34 | 5.46 |
| e | 1.300BSC | | |
| A | 2.20 | 2.30 | 2.38 |
| A1 | -- | -- | 0.127 |
| c | 0.45 | 0.50 | 0.60 |
| c2 | 0.45 | 0.50 | 0.58 |
| D1 | 5.20 | -- | -- |
| E1 | 4.40 | -- | -- |
| θ | 0° | -- | 10° |